C. rosimon has a wide range, being found on the lower outer Himalayas throughout their length, and everywhere in British India except the desert regions of Sind. It occurs in Ceylon, in the Andaman Isles, on Kamorta and Nankowri in the Nicobar group, and from Assam to the Malay Peninsula and Siam, also in many islands of the Malay Archipelago. *C. rosimon* has a near ally in the "*Lycæna*" *hintza* of Trimen, which is confined to South Africa. The male of this species is entirely blue on the upperside, being thereby at once distinguishable from *C. rosimon*.

760. **Castalius ananda,** de N.

C. ananda, de Nicéville, Journ. A. S. B, vol. lii, pt. 2, p 75, n. 14, pl. 1, figs. 11, *male*; 11*a*, *female* (1883).

HABITAT: Sikkim; Khasi Hills; Orissa; Nilgiris; Kadur District, Mysore.

EXPANSE: ♂, ·85 to 1·15; ♀, 85 to 1·05 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* deep shining purple, the outer margins black, and in some specimens with all the black markings of the underside showing through by transparency. UNDERSIDE, *forewing* sullied white, with the following black markings:—a broad basal streak, a transverse streak from the middle of the costa to near the middle of the wing, almost joined to another wider streak placed within it from the subcostal to the submedian nervure; a very irregular discal series of four or five oblong spots; an even submarginal series of seven spots, and a similar but smaller series on the margin divided from the cilia by a very fine black line. *Hindwing* with numerous spots scattered irregularly over the whole surface, and with the submarginal and marginal series as in the forewing; the spot, however, at the base of the tail, and the two confluent ones within it irrorated with metallic greenish scales. *Cilia* dusky throughout. *Tail* long, black with a white tip. FEMALE. UPPERSIDE, *both wings* pale dusky fuliginous, the markings of the underside showing through even more prominently than in the male, and the base thickly irrorated with metallic blue scales. UNDERSIDE, *both wings* as in the male." (*de Nicéville*, l. c.)

"I have taken only twelve males and one female on the northern slopes of the Nilgiris, confined to a quarter of an acre of ground, and evidently belonging to one brood. I found it common at the foot of the Nellyampathy Hills in Cochin in November, 1882." (*G. F. Hampson*).

Occurs in Sikkim in March, October, November and December.

761. **Castalius ethion,** Doubleday and Hewitson.

Lycæna ethion, Doubleday and Hewitson, Gen. Diurn. Lep., vol. ii, p. 490, n. 37, pl. lxxvi, fig. 3, *male* (1852); id., Hewitson, Ex. Butt, vol. v, *Lycæna* pl. i, fig. 5, *male* (1876); id., Snellen, Tijd. voor Ent., vol. xix, p. 152, n. 42 (1876); *Cupido ethion*, Druce, Proc. Zool. Soc Lond., 1874, p. 106, n. 2; *Castalius ethion*, Moore, Proc. Zool. Soc. Lond, 1877, p. 587; idem, id., Lep. Cey., vol. i, p 83, pl. xxxvi, figs. 5, 5a, *male* (1881); id., Butler, Trans. Linn. Soc. Lond, Zoology, second series, vol. i, p. 547, n 2 (1877); id., Wood-Mason and de Nicéville, Journ. A. S. B., vol. l, pt. 2, p. 248, n. 49 (1881); id., Distant, Rhop. Malay., p. 216, n. 2, pl. xxii, fig. 25, *male* (1884).

HABITAT: Nilgiris, Travancore, Ceylon, Andaman Isles, Naga Hills, Sylhet, Burma, Malay Peninsula, Siam, Sumatra, Java.

EXPANSE: 1·0 to 1·25 inches.

DESCRIPTION: MALE. "UPPERSIDE, *both wings* crossed by a broad medial irregular white band broadly bordered on both sides with blue, the outer margins broadly dark brown. UNDERSIDE, *both wings* white, crossed near the base by two dark brown bands, and near the outer margin by a double series of brown spots. *Forewing* with a large spot on the costal margin near the apex, a similar spot on the inner margin, and a small spot between them, dark brown. *Hindwing* with a band of three large spots below the middle, two black spots bordered with silver at the anal angle." (*Hewitson*, l. c.) "FEMALE. UPPERSIDE very like *C. roxus*, Godart, but with the white band extending nearly to the costa of the *forewing*, internally excavated and externally broadly truncate-clavate at its upper extremity. UNDERSIDE, *both wings* white, spotted with dark brown, as in the male." (*Butler*, l. c.)

C. ethion is a very beautiful species, the iridescent blue of the upperside of the male being of a very lovely shade. The female lacks this colour altogether, its place being taken by black.

Mr G. F. Hampson states that it is "common on the lower slopes of the Nilgiris." In Ceylon it occurs at Galle and Kandy, very common (*Wade*) There are two old specimens from Sylhet and the Naga Hills in the Indian Museum, Calcutta (these *localities however require* confirmation); it occurs at Chittagong, and Dr. J Anderson *obtained it in the Mergui* Archipelago. Mr. Distant records it from Sunjei Ujong and Malacca, and Mr. Butler from Singapore, all in the Malay Peninsula.

762. **Castalius airavati,** Doherty. (FRONTISPIECE, FIG. 133 ♂).

C airavati, Doherty Journ A S B vol lv, pt 2, p 261, n 16 (1886).

HABITAT *Gonyi, Great Nicobar.*

EXPANSE: ♂, 1·3; ♀, 1·2 inches

DESCRIPTION: "Allied to *C ethion*, Doubleday and Hewitson MALE UPPERSIDE, *both wings* light, shining blue, the outer borders broadly, and the costa of the forewing narrowly black; a white band crosses both wings which has its upper part wide in the forewing, centering between the third median and lower discoidal nervules, thence to the hind margin it is slender and almost obsolescent; on the hindwing it is narrow and angular. UNDERSIDE, *both wings* with the ground ochreous white (it is white in *C. ethion*), pure white on the lower part of the forewing. It differs from *C ethion* below in the increased size of all the black markings. The transverse discal band across the hindwing though irregular, is continuous, its two parts very close together, the upper one is widely united near the costa with the outer of the two oblique basal stripes; the latter are united in both wings, enclosing a narrow white band. The two lines of submarginal spots are less equal and regular than in *C. ethion*, the inner one being very large and forming an almost continuous and very heavy lunular line; the anal and subanal black spots are edged with silvery blue. Tail shorter than in *C manluena*, Felder" (*Doherty*, l c) FEMALE UPPERSIDE *both wings* entirely lacking the blue gloss of the male, the discal white band rather broader UNDERSIDE, *both wings* as in the male.

Mr. E H Man has sent me four males and two females of this species from Great Nicobar It is a very distinct as well as beautiful species In only one of my specimens is the discal black band on the underside of the hindwing united near the costa with the outer of the two basal bands, as will be seen from my figure of the species

The figure shows both sides of a male specimen from Great Nicobar in my collection.

763. **Castalius roxus,** Godart.

Polyommatus roxus, Godart Enc Méth, vol ix, p 659, n 142 (1823), *Lycæna roxus*, Horsfield, Cat. Lep E I C, p 70 n 5 pl ii, figs. 4, 4a, *female imago*, 4b—*f*, *structure of imago* (1828) *Cupido roxus*, Druce, Proc Zool Soc Lond, 1873, p 348, n 3, *Castalius roxus*, Butler, Trans Linn Soc Lond Zoology, second series, vol i p 547, n 3 (1877), id, Moore, Proc Zool Soc Lond, 1878 p 833 id, Wood Mason and de Nicéville, Journ A S B, vol. l, pt 2, p 248, n 51 (1881) id, Distant, Rhop Malay p 216, n. 3, pl xxii, fig 24, *male* (1884) id, Elwes and de Nicéville, Journ. A S B, vol lv, pt 2, p 428 n 92 (1886).

HABITAT Andaman Isles, Burma, Malay Peninsula, Sumatra, Java, Borneo, Philippines.

EXPANSE: ♂, ♀, 1·1 to 1·2 inches

DESCRIPTION. "MALE UPPERSIDE, *both wings* blackish brown, with a very broad band of yellowish-white, situated on the posterior edge [inner margin] arising on the disc of the forewing, and passing obliquely over the disc and base of the hindwing *Cilia* grayish UNDERSIDE, *both wings* white, inclining to pale yellow, with a broad fascia of blackish brown, extending from the middle of the costa of the forewing obliquely over the base of the hindwing to the thorax; at the point where it meets the costa commences a curved, irregularly-interrupted macular fascia, consisting of diversified spots and patches of blackish brown *Forewing* has exterior to this *a narrow brown margin, regularly waved at its inner edge, bearing a row of oblong* yellowish spots. *Hindwing* has a series of uniform lunulæ directed outwards, touching a narrow black marginal streak and inclosing a series of white lineolæ, in continuation of the marginal markings of the forewing. *Head*, *thorax*, and *body*, deep blackish-brown above, yellowish underneath ; *abdomen* banded with yellow at the sides ; *antennæ* marked with delicate annuli. *Tail* filiform, black, tipt with white. FEMALE with the wings broader and more expanded than in the male, and the abdomen more robust. UPPERSIDE, *forewing* with the transverse band approaching nearer to the costa than in the male, its posterior edge more deeply sinuated. *Hindwing* has an interrupted row of obscure yellowish lineolæ, parallel with the margin." (*Horsfield*, l c.)

The female of *C. roxus* may be known from that sex of *C. ethion* by having only one basal black band across both wings on the underside, while the latter has two such bands. Dr. Horsfield in 1829 recorded that " Hitherto this species has only been found in Java : it occurs, in considerable numbers, in the skirts of large forests ; but from the great delicacy of the wings it is not easily obtained in a perfect state." Further and later experience has shown that it has a wide distribution. But within our limits it is distinctly rare, the only specimens I possess being two taken in the Thoungyeen forests. Upper Tenasserim, one in March, the other in the autumn, and a few from the Andaman Isles. Mr. Moore records it from Moulmein to Meetan : Colonel Lang, R.E, took one specimen in the Tenasserim Valley in March : and the collector of the Indian Museum, Calcutta, obtained it at Ponsekai on the borders of Siam. Mr. Distant records it from Sunjei Ujong and Malacca, and Mr Butler from Singapore, all in the Malay Peninsula. It has been recorded also from several islands in the Malay Archipelago. Mr Elwes records it* from Sikkim as ' common up to 4 or 5,000 feet from April to October." He has wrongly identified the species, which does not occur in Sikkim at all.

764 **Castalius manluena,** Felder.

Lycæna manluena,† Felder, Verh. zool -bot. Gesellsch. Wien, vol. xii, p. 484. n. 117 (1862) ; *Castalius manluena*, Moore, Proc. Zool. Soc. Lond , 1877, p. 587 , id., Doherty, Journ. A. S. B ; vol. lv, pt. 2, p. 261, n. 15 (1886) ; idem, id., l. c , vol. lviii, pt. 2, p. 134, pl x, fig. 8, *male* (1889)

HABITAT : Kondul (*Felder*) ; Ikuya, Little Nicobar (*Doherty*).

EXPANSE : ♂, 1·05 inches.

DESCRIPTION : "FEMALE. Wings very shortly tailed, fuscous-brown on both sides, a common sinuate discal fascia and marginal spots white. UNDERSIDE with a white vitta at the base of the costa of the *forewing*, and a common external white fascia, inwardly sinuate, outwardly undulate."

"A female, much smaller than *L.* [= *C.*] *roxus*, Godart, which appears to be the nearest allied species. The white spots on the margin arranged in rows on the upperside, and the absence of the short white band at the base of the costa on the underside of the hindwing are the only satisfactory distinguishing features of the new species. " (*Felder*, l. c.)

"MALE. UPPERSIDE, *both wings* black, with a broad white discal band, extending on the forewing from the hind margin to above the lower discoidal nervule, just entering the cell, at the end of which it is strongly indented from above ; prolonged outwardly between the second and third median nervules ; on the hindwing it is broad, strongly produced outwardly, acutely indented inwardly. *Hindwing* with a slender marginal white line, broken at the veins ; tip of tail white. UNDERSIDE *Forewing*, ground-colour white, base dark with a white longitudinal line close to the costa ; a black mass extending obliquely from the base of the hind [inner] margin to the middle of the costa, where it joins a broad black subapical area which extends thence to the second median nervule, there it is connected (slightly) with the broad submarginal dark band, and with an outer discal dark area lying between the third median nervule and the hind margin. *Hindwing* with a basal black mass untouched with white, and a discal band, irregular but unbroken, crossing the wing, and a submarginal line of wide, joined black lunules uniting at the apex with the discal band. Allied to *C. roxus*, Godart."

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* *Castalius roxus*, Elwes, Trans. Ent Soc Lond., 1888, p. 386, n. 268.

† " What Doctors are called in the Nicobar Islands. " (*Felder*, l. c.)

"A male taken by me at Iknya, Little Nicobar. The prehensores are quite distinct from those of the next species [*C. airavati*, Doherty]. The species is without metallic markings either above or below. Felder's female, with which this male seems conspecific, is, as he remarks, distinguished from *C. roxus*, Godart, and allied species by the absence of all white at the base of the costa of the hindwing below. This also distinguishes it from *C. airavati*, Doherty. The unbroken transverse discal band of the hindwing distinguishes the two Nicobarese species from all others. The female has, according to Felder, white marginal spots on both (?) wings above" (*Doherty*, l. c.)

Through the kindness of Mr. W. Doherty I have seen the unique specimen in his possession described as above. On the underside the black markings occupy quite one-half of the surface; in *C. roxus* they do not occupy more than one-fourth. The two species seem to be abundantly distinct.

765. **Castalius elna,** Hewitson.

Lycæna elna, Hewitson, Ex. Butt., vol. v, *Lycæna* pl. 1, fig. 8, *female* (1876); *Castalius elna*, Moore, Proc. Zool Soc, Lond., 1877, p. 587; id., Wood-Mason and de Nicéville, Journ. A. S. B., vol. l, pt. 2, p. 248, n. 50 (1881); id., Distant, Rhop. Malay, p. 217, n. 4, pl. xx, fig. 4 (1884).

HABITAT: Sikkim, Bhutan, Assam, Orissa, Upper Tenasserim, South Andaman Isles, Malay Peninsula, Java.

EXPANSE: ♂, ♀, 1·2 to 1·4 inches.

DESCRIPTION: MALE and "FEMALE. UPPERSIDE, *both wings* dark brown, crossed by a common broad white band commencing at the first discoidal nervule of the forewing where it is marked by a minute black spot and projects outwards. UNDERSIDE, *both wings* white, crossed near the base by a broad band of black [elbowed in the forewing] *Forewing* with a large spot near the apex, a similar spot near the anal angle, the apex, the outer margin, and a spot at its middle, all black. *Hindwing* with a spot near the apex, a quadrifid band above the anal angle, the outer margin, and a submarginal series of lunular spots, all black." (*Hewitson*, l. c.)

"Specimens of both sexes from the Andamans are variable in the size and connections of the black spots and bands of the underside, and want the minute black spot at the anterior end of the common white band of the upperside." (*Wood-Mason* and *de Nicéville*, l. c.)

This is a very common species in Sikkim. In the rains form the white discal band of the upperside is very narrow, in some specimens not more than 1/16 of an inch in width on the forewing, the markings of the underside deep black. In those specimens which occur in the cold dry weather the discal white band on the upperside of the forewing occupies half the wing, while all the hindwing is white, except a narrow black basal band, and a narrow marginal similar band. On the underside the ground-colour in this form, instead of being white, is suffused with cinnamon colour, and the markings, instead of being black, are cinnamon-brown, approaching to black on the costa, at the anal angle, and at the base of the forewing only. I am not a little surprised that this very distinct seasonal form should have hitherto escaped being described as a "new species."

The occurrence of this species in an isolated locality like Orissa is not a little remarkable, though that district shows many similar instances. It is a common species in the Andaman Isles, but does not appear to occur in the Nicobars, and it is recorded by Mr. Distant from Sunjei Ujong, Malacca, and Singapore in the Straits Settlements.

766. **Castalius decidia,** Hewitson.

Lycæna decidia, Hewitson, Ex. Butt, vol. v, *Lycæna* pl. i, fig. 4 (1876); *Castalius decidia*, Moore, Lep. Cey., vol. i, p. 84 (1881); *C. hamatus*, id., [illegible], p. 84, pl. xxxvi, figs. 6, 6a (1881); *C. interruptus*, de Nicéville, Journ. A. S. B., vol. lii, pt 2, p. 74, n. 13, pl. i, fig. 12, *female* (1883); id., Moore, Proc. Zool. Soc. Lond., 1883, p. 523, pl. xlviii, fig. 4.

HABITAT: Bombay, Rohilkund Terai, Malda, Sikkim, Assam, Burma, Orissa, Ganjam, Nilgiris, Travancore, Ceylon.

Expanse: ♂, ♀, 1·0 to 1·3 inches.

Description: **Male** and **female**. "**Upperside**, *both wings* dark brown, crossed by a common broad band of white commencing at the lower discoidal nervule of the forewing where it projects towards the outer margin. **Underside**, *both wings* white. *Forewing* with a small spot at the base, a band before the middle, a large spot on the costal margin near the apex, a large spot at the anal angle; the apex (which is marked by two white spots), the outer margin and a spot at its middle, all dark brown. *Hindwing* with a band near the base, a small spot on the inner margin, a large spot below this, a bifid spot near the apex, a spot between these, and a series of submarginal lunular spots, all dark brown." (*Hewitson*, l. c.)

Mr E. E. Green sends me the following note on the transformations of this species in Ceylon under the name *C. hamatus*, Moore. "**Larva** feeds upon the leaves of *Gonania microcarpa*. Colour pale bright green, with two dorsal stripes of a darker shade; a lateral fringe of very fine soft hairs; segments expanded laterally into small flattish lobes. **Pupa** pale pink, minutely speckled with brown, and with a dark brown median line."

The butterfly is found in the "Western and Central Provinces of Ceylon. Plains and Hills up to 4,000 feet. Common in low-country forests from June to October. Flits about the tops of shrubs and low trees, settling among the leaves." (*Hutchison* in Lep. Cey.)

"*C. decidia*, Hewitson, *C. hamatus*, Moore, and *C. interruptus*, de Nicéville, are probably all forms of one species, differing only in the extent of the black markings, which are more extensive in the first, less so in the second, and still more restricted in the last. *C. decidia* is found commonly on the lower slopes of the Nilgiris." (*G. F. Hampson*). Mr Hampson has made a slight mistake, it is *C. hamatus*, and not *C. decidia*, which has the black markings on the underside the most extensive.

"I believe, but am not quite certain, that I have caught *C. decidia* in Bombay. It is not uncommon on the hills." (*Aitken*, Journ. Bombay Nat. Hist. Soc., vol. i, p. 217, n. 59 (1886).

C. decidia exhibits seasonal dimorphism to a greater extent even than *C. elna*, Hewitson, and exactly in the same direction. It has not been so fortunate, however, as that species in having these forms unnamed. In all localities where there are two well-marked seasons, we find *C. decidia* putting forth corresponding varieties, the darkest form of course occurring in the middle of the rains, the lightest in the middle of the dry-season, and intermediate forms between these seasons. I give below as foot-notes the descriptions of *C. hamatus*, Moore, and *C. interruptus*, mihi.*

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* *Castalius hamatus*, Moore, Lep. Cey., vol. i, p. 84, pl. xxxvi, figs 6, 6a (1881). **Habitat**: Nilgiris (*Hampson*), Ceylon (*Moore*). **Expanse**: *Male* and *female*, 1·05 inches. **Description**: "**Male**. **Upperside**, *both wings* dark violet black, with a narrow white medial discal transverse band, which is attenuated and hooked outwards at its anterior end below the costa [on the forewing], the band on both wings is also crossed by black veins, and thickly black speckled on the hindwing. *Cilia* white alternated with black. **Underside**, *both wings* white. *Forewing* with [a spot at the base], a broad black subbasal band curving inwards from the costa, an oblique short subapical and a lower discal band, a marginal lunular band which is dilated at both ends and projected inwards from the middle. *Hindwing* with a black basal curved band, a small contiguous spot on the abdominal margin, a large upper and lower irregular discal spots, and a smaller intervening spot, a marginal row of lunules. **Female**. **Upperside**, *both wings* with the white band broader and more acutely hooked in the forewing than in the male. **Underside**, *both wings* as in the male. *Palpi* black above. *Legs* black with white bands." (*Moore*, l. c.)

"Galle and Kandy. Very common." (*Wade*). "Found rarely on the lower slopes of the Nilgiris." (*G. F. Hampson*).

Castalius interruptus, de Nicéville, Journ. A. S. B., vol. lii, pt. 2, p. 74, n. 13, pl. i, fig. 12, *female* (1883); id., Moore, Proc. Zool. Soc. Lond., 1883, p. 523, pl. xlviii, fig. 4. **Habitat**: Bombay; Rohilkund Terai; Bholahât, Malda; Sikkim, Shillong, Assam, Khurda, Orissa; Nilgiris. **Expanse**: 1·00 to 1·20 inches. **Description**: "**Male** and **female**. **Upperside**, *both wings* pure white. *Forewing* with the base thickly irrorated with black scales, beyond with a dense black patch widest on the costa, inwardly recurved below the submedian nervure, from whence it suddenly narrows. In some specimens the irrorated black scales at the base of the wing and the black patch beyond are entirely merged into one black basal patch, and the costa throughout is widely black. The apex widely, the outer margin as far as the first median nervule less widely, then to the inner margin more widely again deep black; with a round black spot above the first median nervule coalescing with the black border, this spot is sometimes entirely separated, in other specimens very indistinct, and lastly in others its form is entirely lost in the black margin. *Hindwing* with the immediate base and a few irrorated spots beyond black, the outer margin also black, enclosing immediately within a black anteciliary fine line a more or less prominent and complete series of white oblong marks between the nervules. **Underside**, *both wings* with the markings arranged as in *C. hamatus*, Moore, but smaller and more restricted, especially on the *hindwing*. *Cilia* on both sides on both wings white, *C. decidia* may instantly be distinguished from *C. elna* by the presence, in every variety of it, of a clavate longitudinal black mark at the extreme base of the forewing on the underside. In Sikkim it is a common species both in the lower hills and Terai, extending eastwards to Shillong. Along the foot of the Himalayas it is recorded from as far west as Rohilkund, where Colonel Lang, R. E., took it (the *interruptus* form) in the Sâl forests of the Terai in the north of the Pilibhit district in December. It occurs also in the Chittagong Hill Tracts; Major C. H. E. Adamson has sent me a specimen taken at Bhamo, Upper Burma, in July; Mr. W. H. Irvine has obtained long series of it at Bholahât, in the Malda district; as also has Mr. W. C. Taylor in Orissa. It is common in the Nilgiris and Ceylon, and occurs in Bombay.

Genus 124.—POLYOMMATUS, Latreille. (PLATE XXVII).

Polyommatus, Latreille, Sonnerat's Buffon, vol. xiv, p. 116 (1805); idem, id., Gen. Crust. et Ins., vol. iv, p. 206 (1809); id., Moore, Lep. Cey., vol. i, p. 93 (1881); id., Distant, Rhop. Malay., p. 230 (1884).

"FOREWING, triangular; *costa* slightly arched, *exterior margin* oblique and slightly convex towards the apex, *posterior* margin straight; *costal nervure* extending to half length of wing; *first subcostal nervule* short, emitted at nearly one-half before the end of the discoidal cell, *second* subcostal short, emitted at one-fifth before the end of the discoidal cell, *third* subcostal bifid, and emitted close to the end of the cell, *fourth* subcostal at one-half from the third and terminating at the apex, *fifth* subcostal [upper discoidal] from the end of the cell; [*middle* and *lower*] *disco-cellular* nervules nearly erect, of equal length, radial [*lower discoidal*] nervule from their middle; *discoidal cell* broad, extending to a little beyond half length of the wing; *third median nervule* from the end of the cell, *second* median at one-fifth, and *first* median at one-third before the end of the cell; *submedian nervure* nearly straight. HINDWING, bluntly oval, furnished with a single slender tail [at the termination of the first median nervule]; *costal nervure* much arched from the base; *first subcostal nervule* curved, emitted at one-fourth before the end of the cell; *disco-cellular* nervules very slender, *upper* disco-cellular slightly concave, *discoidal* nervule from their middle; *third* and *second median* nervules from the end of the cell, *first* median at one-third before the end, *submedian nervure* straight, *internal* nervure recurved, short. BODY stouter than in *Lampides*, Hubner; *palpi* porrect, long, slender, flattened, fringed beneath; *legs* slender; *antennæ* with the club stout, grooved; *eyes* hairy. Type, *P. bœticus*, Linnæus." (*Moore*, l. c.)

Forewing has the first subcostal nervule emitted beyond the middle of the discoidal cell, quite free from the costal nervure, second subcostal emitted much nearer to the base of the upper discoidal than to the base of the first subcostal nervule, third subcostal emitted at about midway between the base of upper discoidal and apex of wing, middle and lower disco-cellular nervules nearly erect, of nearly equal length and slightly concave, second median nervule emitted long before the apex of the cell. Hindwing, disco-cellular nervules outwardly oblique, of equal length, concave; second median nervule emitted just before the apex of the cell. The transformations are described under *P. bœticus*.

Until lately, *Polyommatus* has been confined to a single species, but Mr. Distant has described *P. bagus* from apparently a single female example only from Province Wellesley. It is not improbably an aberration or "sport" of *P. bœticus*. The typical species (*P. bœticus*) is violet-blue on the upperside of the male, the coloration having a frosted appearance owing to the presence of very long hair-like scales over the entire surface. There is a conspicuous black

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marked with a black spot at the tip of each nervule. *Tail* black with a white tip. The male differs from the female only in having the apex of the forewing more produced."

"Closely allied to *C. decidia*, Hewitson, and to *C. hamatus*, Moore, but differing from Ceylon specimens of the latter in that the black markings on the upperside of both wings are far more restricted, and on the underside of the hindwing the markings are much smaller and partially separated into spots." (*de Nicéville*, l. c.)

MALE and FEMALE. "UPPERSIDE, *forewing* white, with a blackish-brown broad costal band, which is widely interrupted to near the costal edge at the end of the cell, the subapical inner angle of the band acute, the band then extending down the exterior margin and ascending above the posterior angle into a clavate knob to the disc. *Hindwing* white, base slightly black-speckled; a very narrow marginal band traversed by white lunules along the outer edge. UNDERSIDE marked similarly to *C. decidia*, Hewitson." (*Moore*, l. c.)

"Bombay" (*Moore*). "Found commonly on the lower slopes of the Nilgiris." (*G. F. Hampson*).

As above recorded this form has been taken in the Sâl forests of the Terai in the North of Rohilkund in December by Colonel Lang.

spot on the outer margin of the hindwing just beyond the base of the tail, and two smaller spots interior to it. The underside is quite unique amongst the true "blues," being furnished throughout the hindwing and largely on the forewing with short transverse brown lines margined with whitish, on the hindwing there is usually a conspicuous submarginal white or whitish band, and two black spots at the anal angle spangled with metallic silvery. The female is not frosted like the male, the upperside is fuscous, the base and disc of the wings metallic bluish, the hindwing with a marginal series of black spots and a discal macular pale band. *P bœticus* has an immense range in the old world, and occurs in Australia ; in this respect it is only surpassed by *Everes argiades*, Pallas, which is found in North America as well.

767. **Polyommatus bœticus,** Linnæus. (PLATE XXVII, FIG. 190 ♂).

Papilio bœticus, Linnæus, Syst. Nat , ed. xii, vol. i, pt. 2, p 789, n 226 (1767) ; id , Fabricius, Syst. Ent., p. 522, n. 333 (1775) ; idem, id , Sp Ins., vol. ii, p. 119, n. 529 (1781) ; idem, id., Mant. Ins , vol. ii, p 69, n. 657 (1787) ; id., Esper, Schmett , vol. i, pt 1, pl. xxvii, figs 3*a*, *b* (1778) ; pt. 2, pl. xci, fig. 3 (1784) ; id., Hübner, Eur Schmett., vol. i, figs 373, 374, *male* ; 375, *female* (1798-1803) ; *Polyommatus bœticus*, Godart, Enc. Méth., vol. ix, p. 653, n. 122 (1823) ; *Lampides bœticus*, Butler, Cat. Fab. Lep. B M , p. 165, n. 11 (1869) ; id., Semper, Journ. Mus Godef , vol xiv, p 158, n 63 (1879) ; *Lycæna bœticus*, Snellen, Tijd. voor Ent., vol. xix, p. 152, n. 45 (1876) : *Cupido bœticus*, Aurivillius, Öfv. Vet -Ak. Förh , vol. xxxvi, p. 44, n. 12 (1879) ; id , Snellen, Tijd. voor Ent , vol. xx, p 66 (1877) ; idem, id l c , vol. xxi, p. 23, n. 90 (1878) ; id , Wollaston, Ann. and Mag. of Nat. Hist , fifth series, vol. iii, p 223 (1879) . *Hesperia bœtica*, Fabricius, Ent. Syst., vol iii, pt 1, p 280, n 77 (1793) ; *Lycæna bœtica*, Horsfield. Cat Lep. E I C., p 80, n 14 (1828) , id., Boisduval, Sp Gén , vol i, pl. vii, fig 9, *male* (1836) ; id., Miller, Ann Soc Linn , Lyons, 1861, p. 129, pl iv, figs. 1-6 , id , Guénee, Ann Soc Ent France, fourth series, vol vii, p 665, pl. xiii, figs. 9-12, *five posterior segments of larva showing special organs* (1867) ; id. Lang, Butt. Eur., p 99, n. 1, pl. xxii figs 2, *male* and *female* ; pl. xxviii, fig 5, *pupa* (1884) ; *Lampides bœtica*, Walker, Ent., vol v, p 52, n. 2 (1870) ; id., Newman, Britt. Butt., p. 117, fig. 39 (1874) ; *Lycæna bœtica*, Trimen, Rhop Afr. Aust., vol ii, p 236, n. 138 ; also p. 342 (1866) ; id., Elwes, Proc Zool. Soc. Lond., 1881, p 887 ; id , Trimen, South Afr -Butt , vol. ii, p. 58, n. 147 (1887) ; id., Pryer, Rhop. Nihonica, p 17, n 50, pl. iv, fig 22, *male* (1888) ; *Cupido bœticus*, Kirby. Syn. Cat Diurn Lep., p. 354, n. 114 (1871) ; *Lampides bœticus*, Butler, Trans Linn. Soc. Lond., Zoology, second series, vol. i, p. 547, n. 6 (1877) . *Lycæna bœticus*, Mabille, Bull Soc Zool. Fr , 1877, p. 215 ; *Polyommatus bœticus*, Moore, Lep. Cey , vol i, p 93 (1881) ; id , Butler. Trans. Ent. Soc. Lond., 1882, p. 31, n. 1 ; id , Distant, Rhop Malay , p 214, fig 64, *neuration of forewing* ; p. 230, n. 1, pl. xx, figs. 8, *male* ; 1, *female* (1884) ; *Papilio coluteæ*, Fuessly, Schweiz Ins , p 31, n 594, figs. 2, 2 (1775) ; *Papilio damoëtes*, Fabricius, Syst. Ent., p. 526, n. 350 (1775) , idem, id , Sp. Ins., vol. ii, p 124, n 558 (1781) ; idem, id , Mant., Ins. vol. ii, p. 77, n 707 (1787) ; id., Donovan, Ins New Holl , pl. xxxi, fig. 2 (1805) ; *Hesperia damoëtes*, Fabricius, Ent Syst., vol. iii, pt. 1, p. 303, n. 148 (1793) , *Polyommatus damoëtes*, Godart, Enc. Méth., vol ix, p. 680, n 198 (1823) ; *Lycæna damoëtes*, Horsfield, Cat. Lep. E. I. C., p. 81, n. 16 (1829) ; *Papilio damætas*, Esper, Gesch eur. Schmett., pl. xxviii, figs. 1*a*, *larva* ; 1*b*, *pupa* ; pl. xxix, figs. 1*a*, *larva* ; 1*b*, *pupa* . pl. xxix, figs. 1*a*, *larva* ; 1*b*, *pupa* (1806—18) ; *Papilio pisorum*, Fourcroy, Ent. Paris, vol. ii, p. 242, n. 25 (1785) ; *Papilio archias*, Cramer, Pap Ex., vol. ii, pl. clxxxi, fig. C (1777) ; *Lycæna archias* ? Herrich-Schäffer, Stett. Ent. Zeit , vol. xxx, p. 73, n. 28 (1869).

HABITAT : England (rarely), South Europe (excepting eastern portions), Central and South-West France, Switzerland, Germany, Belgium, Madeira, Canary Isles, Teneriffe, St. Helena, Madagascar, Mauritius, Bourbon, almost throughout Africa, almost throughout Asia (except the northern portions and Amurland), China, Japan, Ceylon, Nias Island, Sumatra, Java, Batchian, Waigiou, Bantam, Celebes, Ceram, Aru, Duke of York Island, Australia, Sandwich Islands, Hawaiian Islands.

EXPANSE : ♂, ♀, ·9 to 1·6 inches (Indian specimens).

DESCRIPTION : "MALE UPPERSIDE, *both wings* pale violaceous [thickly overlaid with long hair-like scales, giving the wings a frosted appearance]. *Forewing* with the costal margin narrowly and the outer margin more broadly pale fuscous. *Hindwing* with the costal and posterior margins pale fuscous, a large black marginal spot between the second and first median nervules, and two contiguous smaller black spots at the anal angle ; [*tail* black, outwardly fringed to near the tip and the extreme tip white.] UNDERSIDE, *both wings* pale brownish-ochraceous, with the following linear brownish fasciæ margined with greyish :—*forewing* with two crossing the middle and two near the end of the cell, two (considerably fractured), crossing the wing between the end of the cell and the outer margin, commencing near the fourth subcostal nervule [terminal portion of subcostal nervure] and terminating at the submedian nervure, two submarginal (the innermost broadest), and the outer margin narrowly pale fuscous:—*hindwing* crossed from the base to beyond the middle with about eight linear fasciæ as on the forewing (more or less fused and broken), followed by a distinct and somewhat broad greyish fascia, and with two submarginal linear brownish fasciæ; two large marginal spots containing a few scattered greenish [metallic] scales, and inwardly margined with pale reddish-ochraceous, separated by the first median nervule; the outer margin narrowly fuscous. *Cilia* of both wings pale brownish, the tips greyish-white. *Body* above more or less concolorous with the wings, beneath greyish-white *Legs* greyish-white, more or less streaked with brownish. FEMALE. UPPERSIDE, *both wings* pale brownish. *Forewing* with a discal bluish patch. *Hindwing* with [the base irrorated with iridescent blue], two outer greyish submarginal fasciæ, the intermost broadest; black anal angular spots as in the male, distinctly margined with greyish. UNDERSIDE, *both wings* as in the male." (*Distant*, l. c.)

LARVA when *full-grown measures 7/16 of an inch in length*; pale dull green throughout, slightly shagreened, but not hairy, except slightly so at the sides; the small retractile head smooth, ochreous pale brown, shining, a dorsal line of a somewhat darker green than the ground, no other markings whatever, altogether a very plain looking creature. The constrictions at the segments shallow, the spiracles black but inconspicuous, the usual extensile organs on the twelfth segment very short. Larva feeds on the yellow pea like flowers and on the pods of *Crotalaria striata*, D. C., in Calcutta. Dr A. Forel of Geneva has identified the three species of ants which I have found attending this larva in Calcutta as *Camponotus rubripes*, Drury (*sylvaticus*, Fabricius), subspecies *compressus*, Fabricius; *Tapinoma melanocephalum*, Fabricius; and *Prenolepis obscura*, Mayr (var. *clandestina*, Mayr). PUPA pale yellowish-green, the posterior end very blunt and rounded, the abdominal segments larger than the anterior, the head small, a dark dorsal line, a double subdorsal series of small black spots, the thorax slightly humped on the back, the pupa smooth throughout.

Dr Lang describes the larva in Europe as "green or olive, or sometimes reddish-brown, with a dark dorsal stripe The spiracles are yellow, and below there is a white lateral stripe; above the spiracles on each segment is an oblique line, paler than the ground-colour. Pupa reddish yellow, dotted with brown, and with black spiracles. The larva feeds in the pods of the common pea, also on *Colutea arborescens* [the "bladder senna"], and on various leguminous plants, devouring the seeds. The eggs are laid in the autumn on the twigs of the plants, the newly emerged larva entering the young pods in the following summer; when it is fully grown it undergoes its pupation on the stems or in the leaves" Professor Trimen describes the transformations of this species in South Africa as follows.—"Larva bright green, paler on the under surface A dark green dorsal line: beneath it, on each side, an indistinct line interrupted on each segment, followed by a row of short, oblique, indistinct streaks of the same dark green, and a pale green line just above the legs. Head small, shining, reddish-brown. Two-thirds of an inch in length Feeds on the flowers of *Crotalaria capensis* (a Papilionaceous shrub), in which it lives Pupa very pale greyish-ochreous, dusted unequally with blackish, the wing-covers more greenish in tint; a fuscous line down the back, some blackish spots on the head and back, two rows of blackish spots on each side of the back of the abdomen. About half an inch in length; thickest and roundest in abdominal region;. head blunt." The Rev. Thomas Blackburn describes the larva as found by him in the Hawaiian Islands as follows:—"Obscure olive-green, pretty thickly sprinkled with short hairs (much the appearance of a bristly surface badly shaved); dorsal and subdorsal lines and the region included obscurely rosy; head testaceous, bearing a black V-shaped mark, which points backwards; the rosy markings vary in intensity, as also the ground-colour; legs of the ground-colour; spiracles white Onisciform. Feeds in pods of what appears to be a *Melilotus*." (Trans. Ent. Soc. Lond., 1882, p. 31.)

I have given these various descriptions of the transformations of *P. bœticus*, as from them it would appear that the insect is much more variable in the earlier portion of its history than it is later on as a butterfly. I think this will be found true of very many of the larvæ of the *Lycænidæ*, which, as far as my experience goes, vary in coloration and markings in the most extraordinary and puzzling manner.

Little need be said about this common butterfly with regard to its distribution in India. It occurs almost everywhere, except at very great elevations in the Himalayas, and in perfectly desert regions. It most probably feeds on a great many leguminous plants, and hence can exist almost everywhere. It varies but little except in size, though curious aberrations or "sports" are not very infrequent Its flight is very rapid but shortly sustained (except when migrating ?), and it frequently settles. Colonel Lang reports that at Naini Tal large flights come up in April from the plains flying northwards. Mr. P. W. Mackinnon has remarked the same thing at Masuri in the Spring. If the species is given to migrating, this habit would, in conjunction with the almost universal presence of some species of plant on which the larva can subsist, help to account for its wide distribution in the old world.

The figure shows the upper and undersides of a male specimen from Bholahât in my collection.

An apparently allied species, or. more probably, an aberration or "sport" of *P. bœticus*, has been described as below from a single specimen from the Malay Peninsula.*

The fifth division that I have made in the Indian *Lycænidæ* I call the *Amblypodia* group, and it contains nine genera. The first two genera, *Amblypodia*, Horsfield, and *Iraota*, Moore. may be known from all the other Indian genera, except *Zesius*, Hubner, by having four subcostal nervules (excluding the terminal portion of the subcostal nervure, often called an additional nervule) to the forewing in the male, and three in the female. The additional nervule possessed by the male in these genera is very short, and I am quite at a loss to understand why that sex should alone possess it, its wings being no broader—thus requiring no additional support—than in the female, but being on the contrary, as is usual in that sex, less broad. In both sexes of *Amblypodia* the terminal portion of the subcostal nervure ends on the outer margin some distance below the apex of the wing; this also is the case in *Iraota* in the male only; in the female of *Iraota*, as in all the genera of the Indian *Lycænidæ* which have preceded it (except *Amblypodia*), it ends at the apex of the wing. In these two genera not only is there no upper disco-cellular nervule to the forewing, a feature common to all the other members of the family *Lycænidæ* as far as I am aware, but the middle disco-cellular is also wanting, the lower disco-cellular being alone left. In *Amblypodia* the upper discoidal as usual originates from the subcostal nervure some distance before the apex of the discoidal cell, the lower discoidal is given off from the upper discoidal, and is at first deflected obliquely downwards, its basal portion apparently forming a middle disco-cellular nervule. In *Iraota* the arrangement is again different, the discoidal nervules having almost a common origin, so there is no pretence even of a middle disco-cellular. These two genera are certainly the most aberrant in venation of all the genera of the Indian *Lycænidæ* The male in *Amblypodia* has no secondary sexual characters; both sexes have a lobe to the hindwing, with a rather broad but short tail beyond from the termination of the submedian nervure. The males are dark purple or rich ultramarine blue on the upperside, with no markings. beyond an outer black border. The underside of both sexes is without defined markings, but is more or less mottled and blotched with brown of various shades, and resembles a dead leaf very closely, a mid-rib like band crossing the wings as in the genus *Kallima*, Westwood, from the apex of the forewing to the abdominal margin of the hindwing. The females have the blue or purple coloration of the upperside confined to the disc and base of the wings. The genus is strictly confined to the Indo-Malayan region. The male of *Iraota* has a small tuft of hairs on the inner margin of the forewing near the middle on the underside. Both sexes have a large anal lobe to the hindwing; the male has a tail as in *Amblypodia*, and sometimes a rudimentary tail beyond from the termination of the first median nervule; the female always has this second tail long, the inner tail much longer than in the male, and sometimes it has a third rudimentary tail from the termination of the second median nervule. Both sexes are coloured on the upperside much as in *Amblypodia*, but the blue colour of the male is richly metallic; the markings of the underside are more variegated than in *Amblypodia*, rich silvery spots and blotches often being present, and there is no protective resemblance to a dead leaf. It has almost the same geographical range as has *Amblypodia*, but occur in China also.

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* ***Polyommatus bagus***, Distant, Ann and Mag. of Nat. Hist, fifth series, vol xvii, p. 532 (1886); idem, id., Rhop. Malay., p. 457, n. 2, pl. xliv, fig. 13. *female* (1886). HABITAT: Province Wellesley. EXPANSE: *Female*, 1 2 inches DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* closely resembling those of the same sex of *P. bœticus*, Linnæus. UNDERSIDE, *both wings* pale brownish-ochraceous, with the following linear brownish fasciæ margined with greyish:—two at the end of the discoidal cells and two submarginal fasciæ, the innermost broadest. *Hindwing* with two large, marginal, blackish spots, containing a few scattered greenish scales, inwardly margined with pale reddish-ochraceous, and separated by the first median nervule *Body* above more or less concolorous with the wings. beneath with legs greyish-white; *legs* more or less streaked with brownish." (*Distant*, l. c. in Rhop. Malay.)

The next genus, *Surendra*, Moore, has no secondary sexual characters in the male. Its neuration is most ordinary, resembling that of the *Lycæna* and *Polyommatus* groups. The middle and lower disco-cellular nervules of the forewing are of almost equal length. The outline of the hindwing in the different species shows great variation. In the type species, *S. quercetorum*, Moore, both sexes have an anal lobe, the male one tail from the termination of the first median nervule, the female two from the first and second median nervules respectively. In *S. amisena*, Hewitson, the arrangement is the same, but the tails and anal lobe are much smaller. In *S. florimel*, Doherty, the tails and lobe have entirely disappeared. These two last-named species have been added to the Indian list since my key to the genera of Indian *Lycænidæ* was printed. The males are purple on the upperside with an outer black border; the females of *S. quercetorum* and *S. florimel* are entirely fuliginous-brown on the upperside; the female of *S. amisena* is dull lilac-blue. The coloration of the underside of both sexes of all the species is dull brown, with some obscure whitish, darker brown, and black markings. The genus occurs in India, Ceylon, the Andaman Isles, the Malay peninsula, the Island of Nias, and in Java.

The next five genera may be known by the middle disco-cellular nervule of the forewing being extremely short, only one-third or one-fourth as long as the lower disco-cellular; and the three median nervules of the forewing originating very close together, the first median nervule from a distinct angle of the median nervure, the latter being deflected upwards beyond the base of the first median nervule; the third subcostal nervule of the forewing also is very short. None of these genera possess secondary sexual characters in the male. The first genus, *Apporasa*, Moore, contains but a single species found in Burma, which I have been able to examine since my key to the genera was struck off. It has the subcostal nervules of the forewing as in the other genera of this subgroup; it has a single tail in the hindwing from the termination of the first median nervule, but the outer margin of that wing is throughout very irregular, being more or less toothed at the terminations of all the nervules. The apex of the hindwing is strongly produced upwards or toothed as in the genus *Mahathala*, Moore, the costa between the apex and the base of the wing being at first concave, then straight. Both sexes are purple on the upperside, with broad outer black margins, the underside is brown, mottled and variegated with darker and lighter shades, these markings being arranged in spots and bands, the hindwing sparsely sprinkled with metallic green scales. The next genus, *Thaduka*, Moore, also contains but a single species, and is found only in Burma. Its male appears to be unknown, but the female may be recognised from all Indian *Lycænidæ* (except some aberrant species of the genus *Iraota*) by possessing three well-formed tails to the hindwing besides a very large anal lobe. *T. multicaudata*, Moore, is marked and coloured very much like the single species of *Apporara*, but the apex of the forewing is distinctly acuminate, instead of truncate, and the apex of the hindwing is not produced upwards or hooked as in that species.

I am inclined to think that it would have been better to reduce the three following genera to one, and to use the name *Arhopala*, Boisduval, for the combined genus. They differ but little in neuration, have much the same general *facies*, and all are of some shade of blue or purple on the upperside, save a few species of the genus *Arhopala*, which are brilliant metallic green in the males. *Arhopala* is the largest genus in the family, and it would be of the greatest service to systematists if it could be satisfactorily split up. This has been attempted by Messrs. Moore and Doherty, with, I think, but indifferent success; at any rate I am not prepared to accept the genera which have been proposed, as the characters on which they are based may not be constant and are not easily recognisable. The genus *Arhopala* in its unrestricted sense includes species with a moderate-sized tail at the termination of the first median nervule to the hindwing, with a very short tail on either side of it, these small tails are sometimes absent leaving one moderate-sized tail only, sometimes again this last is also wanting, and the hindwing is quite entire. Some species have an anal lobe, others lack it entirely. The genus occurs in the Indo-Malayan region, and in China, Japan, and Australia. The next genus, *Acesina*, Moore, contains but two species, occurring in N.-E. India and Burma respectively. They have a well-formed tail to the hindwing, and may be recognised by their rather peculiar style of markings on the underside. The genus *Mahathala*, Moore, contains but a single species, which occurs in N.-E. India, thence southwards through Burma to the Malay Peninsula and Siam, reappearing in the Island of Hainan. Like the genus *Apporara*, it has the apex of the hindwing strongly produced hook-like, and has a single spatulate tail from the termination of the first median nervule. The markings of the underside of *M. ameria*, Hewitson are very different from those of *Apporasa atkinsoni*, Hewitson, however, and entirely lack the scattered green metallic scales found in that species.

The last genus of the *Amblypodia* group, the *Curetis* of Hübner, probably has nothing whatever to do with the group; it is quite aberrant and stands alone, and I do not know where better to place it. In neuration it is aberrant, the subcostal nervure of the forewing terminating below the apex on the outer margin in both sexes. The arrangement of the median nervules of the forewing reminds one much of that obtaining in the *Arhopalas*. The males of all the species are rich orange-red on the upperside with varying widths of black margin; the females have this red colour replaced by ochreous or by white. The hindwing is not tailed; but both wings vary much in outline, being in some species quite entire, in others highly angulated. The metamorphoses of the genus are most interesting, the larva and pupa being highly abnormal. It is strictly confined to the Indo-Malayan region and to China and Japan.

Genus 125.—AMBLYPODIA, Horsfield. (PLATE XXVII).

Amblypodia, Horsfield, Cat. Lep. E. I. C., p. 98 (1829); id., Moore, Lep. Cey., vol. i, p. 113 (1881); id., Distant, Rhop. Malay., p. 275 (1885).

"WINGS, broad. FOREWING, arched at the base, *apex* pointed, *exterior margin* almost erect, slightly convex, *posterior* margin slightly waved; *costal nervure* extending to more than half the length of the margin; *first subcostal nervule* emitted at half, *second* subcostal at nearly half, and *third* subcostal at one-sixth before the end of the discoidal cell, third subcostal trifurcate in the male, bifurcate in the female, *fourth* subcostal thrown off at two-thirds, and *fifth* subcostal at one-half from the fourth and terminating below the apex, *sixth* subcostal (or upper radial) from the end of the cell; upper [*middle*] *disco-cellular* nervule short, bent very obliquely outwards, *lower* disco-cellular waved; *lower radial* nervule from their angle near the subcostal nervure; *discoidal cell* broad; *second median nervule* emitted at one-fifth, *first* median at two-fifths before the end of the cell; *submedian nervure* slightly waved. HINDWING, broadly oval, *costa* much arched at the base, *apex* and *exterior margin* very convex, concave hindwards and produced into a short tail, anal lobe broad; *costal nervure* arched at the base and curving to the apex; *first subcostal nervule* at nearly one-half before the end of the cell; *disco-cellular* nervule slightly concave, oblique; *radial* nervule from the middle; *discoidal cell* broad; *second median nervule* from close to the end of the cell, *first* median at nearly one-half before the end; *submedian nervure* slightly curved; *internal* nervure recurved. BODY robust, *thorax* stout; *palpi* porrect, adpressed, second joint squamose, extending one-third beyond the head, third joint short, pointed; *legs* short, thickish; *antennæ* gradually thickening to the tip. Type, *A. narada*," Horsfield. (*Moore*, l. c.)

In the forewing, the costa is evenly arched, rather strongly so at the base of the wing, the apex is acute, the outer margin slightly convex in the male, strongly convex with a slight concavity just below the apex in the female, inner margin long, slightly concave; costal nervure ends a little beyond the apex of the cell; first and second subcostal nervules with their bases very close together; third subcostal originates nearer to the apex of the wing than to the base of the upper discoidal, ending at the apex of the wing in the female; fourth subcostal present in the male only, much longer than usual, its base much nearer to the base of the third subcostal than to the apex of the wing, where it terminates; terminal portion of subcostal nervure reaching the margin below the apex; upper discoidal nervule originating from the subcostal nervure long before the apex of the cell; lower discoidal nervule given off from the upper discoidal some distance beyond the origin of the latter, its base (which apparently forms a middle disco-cellular nervule*) deflexed downwards; lower disco-cellular nervule upright, slightly concave, fully twice as long as the apparent middle disco-cellular; discoidal cell broadest in the middle; second median nervule given off some little distance before the lower end of the cell; submedian nervure at first straight, slightly bent downwards towards its apex. Hindwing considerably broader in the female than in the male, the costa and outer margin evenly and strongly arched, the submedian nervure produced into a short tail, the outer margin anterior to the tail concave, a moderate-sized anal lobe, above which the abdominal margin is excavated, but not very deeply, the abdominal margin convex; costal nervure much arched throughout and ending at the apex of the wing; first subcostal nervule arising some little distance before the apex of the cell; upper disco-cellular nervule shorter than the lower, straight, outwardly oblique; lower disco-cellular slightly concave, nearly upright; second median nervule given off close to the lower end of the cell; submedian nervure straight; internal nervure short, highly recurved. Antennæ very short, one third the length of the costa of the forewing. Eyes naked. Male with no secondary sexual characters.

The arrangement of the discoidal nervules of the forewing is very similar to that obtaining in the next genus (*Iraota*, Moore) but in this genus the lower disco-cellular nervule is given off from the lower discoidal some distance beyond its base, while in *Iraota* these two veins have apparently a common origin. This remarkable arrangement of the discoidal nervules is confined, as far as I know, to this genus and to *Iraota*.

Mr. Doherty describes the egg of *A. narada*, Horsfield, as "large, coarse, overlaid with white, roughly tubercular, and indented with spaces obscurely hexagonal. It greatly resembles that of most of the *Theclinæ*."

LARVA of the usual lycænid shape, onisciform, with head small, second segment much larger, the segments gradually increasing in width to about the seventh, then decreasing to the anal segment, which is bluntly pointed; the constrictions between the segments fairly well-marked; a few short bristly hairs on the sides of the body. PUPA unusually lengthened and attenuated; with head rounded, thorax humped in the middle, abdominal segments very slender, the tail sharply pointed. Described from Dr. Horsfield's figures of the type species.

Seven species of this genus have been described from the region comprised in this work. Of these species, *A. narada*, Horsfield, *A. naradoides*, Moore, and *A. darana*, Moore, both sexes have been described. Of two species, *A. anita*, Hewitson, and *A. andersonii*, Moore, the males only have been described. Of two species, *A. taoana*, Moore, and *A. arracana*, Grose Smith, the sex of the specimens described is not stated. The males of these seven species can be divided into two groups; in the first, they are blue (cyaneous Horsfield; brilliant blue and ultramarine-blue, Moore) on the upperside; in the second, they are purple. The females can be divided into three groups, the first group contains *A. narada* and *A. naradoides*, in these the females are said to be blue; the second group contains a single species which is entirely brown on the upperside, the *A. darana* of Moore; the third group, the female of which has not hitherto been described, contains *A. anita*, and is purple. As the typical male specimen of *A. andersonii* is the only properly authenticated example I have seen, and the descriptions of nearly all the species are so obviously insufficient, I propose to keep all the species that have been described distinct, adding a few notes of my own to each. At the same time, I must record my opinion that there are probably only two distinct species in the Indian region, *A. narada* and *A. anita*, and that even they would be better described as local races than distinct species, as they have been distinguished merely by a slight difference in colour. The undersides of all the species are probably very variable, in over fifty specimens before me as I am writing, no two are exactly alike. They bear almost as strong a protective resemblance to dead leaves as do the species of the genus *Kallima*, Westwood, of the subfamily *Nymphalinæ*, and are furnished, as in those butterflies, with a dark line across the middle of the wings to represent the mid-rib of a leaf, the rest of the surface being very variously mottled and spotted. The head-quarters of the genus appear to be in the dry country of Chota Nagpur and the surrounding regions; where the rainfall is heavy, they are much scarcer. They occur almost throughout peninsular and continental India (except in the desert tracts, the Punjab, and the North-Western Provinces), and they are found in Assam, Burma, the Malay Peninsula, Java, Luzon, in the Andaman Isles (but not in the Nicobar group), and in Ceylon. In the following key I give the recorded locality for each species only.

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* My reason for refusing to call the basal portion of the lower discoidal nervule a middle disco-cellular nervule is that it is obviously as thick as the rest of the nervule, were it a true disco-cellular it would be a very fine vein, and in this respect similar to the lower disco-cellular.

Key to the Indian species of Amblypodia.

A. Males, upperside, both wings blue.
768. A NARADA, Burma, Malay Peninsula, Java.
769. A. TAOOANA, Burma.
770. A. ANDERSONII, Burma.
B. Males, upperside, both wings purple
771. A. ANITA, Sikkim, Madras, Siam.
772. A. NARADOIDES, Ceylon.
773. A. DARANA, Ceylon.
774. A. ARRACANA, Arracan Hills.

768. **Amblypodia narada,** Horsfield.

A. narada, Horsfield, Cat Lep. E. I. Co., p. 98, n. 30; *Thecla narada*, l. c., pl. i, fig. 8, *male*, pl. iv, figs. 4, *larva*; 4*a*, *pupa* (1829); id., Horsfield and Moore, Cat. Lep Mus. E.I.C., vol. i, p. 39, n. 51, pl. 1, figs. 4, *larva*; 4*a*, *pupa* (1857); id., Distant, Rhop. Malay., p. 276, n. 1, pl. xxi, fig. 23, *male* (1885).

HABITAT: Mergui (*Doherty*); Penang, Malacca (*Distant*); Java (*Horsfield*).

EXPANSE: ♂, 1·6 to 2·0 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* blackish-brown, with a cyaneous patch, corresponding in outline with the wings, and covering the whole surface from the base to a regularly-defined distance from the anterior and posterior margins, the tint varying in brilliancy according to the direction of the light. UNDERSIDE, *both wings* brown; a brown band, commencing at the outer apical angle of the forewing passes obliquely through both wings to the anal region of the hindwing, where it forms a gradual curve, and terminates at the middle of the inner margin, having the outer edge regularly defined and of a deeper tint, the inner gradually evanescent; the whole surface of the wing, from the band to the base, is speckled or irregularly mottled with blackish-brown, and on both wings a very obscure stigma is scarcely perceptible; between this band and the posterior margin is a double series of obscure dotted lunules facing each other with their concavities, which in the hindwing is more distinct, with gradually diverging lunules; the margins between the nervules, the inner series of lunules, the anal appendage at its inner edge, and the tail are clouded with whitish dots. FEMALE. UPPERSIDE, *both wings* with the ground-colour paler than in the male, the blue patch has a light azure tint with a purple reflexion, is less widely diffused, especially in the hindwing, and the borders are proportionally broad. UNDERSIDE, *both wings* gray with a glaucous reflexion, the markings, although of the same character, are less prominent than in the male. BODY blackish above, and brown or gray underneath. *Antennæ* almost uniformly brown to the tip, which is ferruginous." (*Horsfield*, l. c.)

LARVA pale green, with a dark (probably pulsating) dorsal line, on either side of which the body is narrowly whitish; the head black, the second segment and the three anal segments marked with black. PUPA pale green, shaded with darker green. Described from Dr. Horsfield's figures.

Mr. Doherty records *A. narada* from Mergui, thus bringing it into the Indian region, while Mr. Distant records it from the Malay Peninsula. Mr. Doherty remarks that "The Mergui form (*A. andersonii*, Moore) of *A. narada* seems identical with that found in the Malay Peninsula. It is of a brighter and richer blue than the North Indian variety." *A. narada* is probably inseparable from *A. taooana*, Moore, and *A. andersonii*, Moore, and not improbably the *A. arracana* of Grose Smith should be ranked as another synonym, though I have placed it in the purple group, as it it described as of that colour, but, as the typical specimen may be a female, and as purple specimens of this sex sometimes occur in the blue group, the species may really belong to the blue group. *A. narada* appears to be a rare species in India.

769. **Amblypodia taooana,** Moore.

A. taooana, Moore, Proc. Zool Soc Lond, 1878, p. 835.

HABITAT: Taoo, 3,500 feet, Upper Tenasserim.

EXPANSE: 2·0 inches.

DESCRIPTION: "Differs from *A. narada*, Horsfield, and *A. anita*, Hewitson, in its larger size, the UPPERSIDE being of a very brilliant blue colour as in *Arhopala silhetensis*, Hewitson, and the outer black marginal band twice the width of that of those species. UNDERSIDE, *both wings* purplish-ochreous, the transverse black-speckled band and basal speckled markings prominent, the band on the *forewing* being much curved, the outer markings also prominent." (*Moore*, l. c.)

Mr. Moore did not state the sex of the specimen he was describing, but I have little doubt that it was a female, which would account for the breadth of the outer black marginal band of the upperside. I have not seen any specimen of the species.

770. **Amblypodia andersonii,** Moore.

A. andersonii, Moore, Journ. A S B, vol. liii, pt. 2, p 43 (1884), idem, id, Journ. Linn. Soc. Lond., Zoology, vol. xxi, p. 44, pl. iv, fig. 4, *male* (1880).

HABITAT: Sampu, Sullivan Island, Mergui Archipelago (January).

EXPANSE: ♂, 1·75 inches.

DESCRIPTION: "MALE. Smaller than *A. taooana*, Moore. UPPERSIDE, *both wings* of a similar tint of ultramarine-blue, with a much narrower black marginal border UNDERSIDE, *both wings* much darker-coloured, but similarly marked." (*Moore*, l. c.)

The type and only known specimen of this species is preserved in the Indian Museum, Calcutta. The blue coloration of the upperside is very rich and beautiful, and at once distinguishes it from every other specimen of the genus I have ever seen, except one of the true *A. narada*, Horsfield, in my collection from the Malay Peninsula, with which it entirely agrees. The expanse of the typical specimen, obtained by measuring from the apex of the wing to the middle of the thorax and then doubling the result (which is, I consider, the only correct way to take the expanse of Lepidopterous insects), is exactly two inches. Mr. Moore gives two inches as the expanse of his *A. taooana*, but measured in the above manner it is probably greater.

771. **Amblypodia anita,** Hewitson. (PLATE XXVII, FIG. 191 ♀).

Amblypodia anita, Hewitson, Cat. *Lycænidæ* B. M., p 14, n. 66, pl. viii, figs. 90, 91, *male* (1862); id., Butler, Proc. Zool. Soc Lond, 1883, p 147, n 8; id., Elwes, Trans Ent. Soc. Lond., 1888, p 403, n. 336; *A. narada*, var *erichsonii* Wood-Mason and de Nicéville, Journ. A. S. B, vol. xlix, pt. 2, p. 234, n. 53 (1880); idem, id., l. c., vol. l, pt. 2, p. 250, n 74 (1881).

HABITAT: Siam (*Hewitson*), Madras (*Butler*), Sikkim (*Elwes*).

EXPANSE: ♂, 1·8 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* purple, the margins rather broadly brown. UNDERSIDE, *both wings* rufous, the base clouded irregularly with black, crossed near the costal margins by two indistinct macular bands of brown. *Forewing* with the apex marked with gray. *Hindwing* with the anal angle marked with gray."

"The males of *A. narada*, Horsfield, and *A. anita*, Hewitson, have a fourth branch from the subcostal nervure, the females, like the rest of the genus [as understood by Hewitson], are without it." (*Hewitson*, l. c.)

In my opinion *A. anita* should be the name by which the commonest species of the genus that occurs nearly all over India, Ceylon, the Andamans, Assam, and some parts of Burma should be known, and that, in South India and Ceylon, has a dimorphic form of female (*A. darana*, Moore). In the Andamans, the females are always more blue than purple on the upperside. I possess a single specimen from the Nilgiris and another from the Chittagong Hill Tracts, which also exhibit this type of coloration. This species occurs most abundantly in the dry district of Beerbhoom, also at Bholahât, Malda, and in the Ranchi district, where Mr. W. H. Irvine has obtained many specimens. It occurs very rarely in Calcutta, but is common in Orissa. Colonel Swinhoe possesses specimens from Karwar in Bombay, and from Madras; I possess specimens from Ganjam and the Nilgiris; it is common in Ceylon; Mr. S. E. Peal has obtained a female at Sibsagar in Upper Assam; it is found also in Burma at Shwayghan and Thyetmyo.

The figure shows both sides of a female specimen from the Andaman Isles in my collection.

772. **Amblypodia naradoides**, Moore.

A naradoides, Moore, Proc. Zool. Soc Lond., 1879, p. 141; idem, id., Lep. Cey., vol i, p. 114, pl xliii, figs. 1, 1*a*, *female* (1881)

HABITAT: Ceylon.

EXPANSE: ♂, 1·5; ♀, 1·87 (2·2 *Moore's figure*) inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark violet purple-brown, with a broad dusky-black marginal band; anal lobe and tail chestnut-brown, the angle white-speckled. UNDERSIDE, *both wings* dark purple-brown; transverse band, speckled marks on basal area, and a submarginal series of speckled spots black, the latter and the anal angle white-speckled. FEMALE. UPPERSIDE, *both wings* dark brown. *Forewing* with the lower basal and discal areas smalt-blue. UNDERSIDE, *both wings* pale brownish-gray, transverse line and speckled markings black; anal angle ferruginous."

"A much darker insect than the Javan species *A. narada*, Horsfield." (*Moore*, l. c. in Proc. Soc. Zool Lond)

In Ceylon this species is recorded from the "Western Province. Plains, in forest land, chiefly during S.-W monsoon, from May to October. Flight like *A.* [=*Arhopala*] *amantes*, Hewitson. Generally rests on leaves, sometimes, but rarely, on the ground" (*Hutchison*). "Kandy. Rather scarce" (*Wade*).

I have nothing to say with regard to this species, except that the male is indistinguishable from the common form which occurs throughout India, and the female is said to be smalt-blue on the upperside, which is the colour of specimens I possess from the Nilgiri Hills, Chittagong Hill Tracts, and Andaman Isles.

773. **Amblypodia darana**, Moore.

A. darana, Moore, Proc. Zool. Soc. Lond., 1879, p. 141; idem, id., Lep. Cey., vol. i, p. 114, pl. xliii, fig. 2, *female* (1881).

HABITAT: Ceylon.

EXPANSE: ♂, 1·90; ♀, 2·12 inches.

DESCRIPTION: "Differs from *A. naradoides*, Moore, in being larger, the UPPERSIDE of the MALE of a deeper violet-blue, the marginal band narrower; anal lobe red only in the middle, its margin and the tail black. UNDERSIDE, *both wings* purple chestnut-brown;

speckled markings black, the marginal series white-speckled. **FEMALE.** **UPPERSIDE**, *both wings* pale violet-brown. **UNDERSIDE**, *both wings* similar to the male." (*Moore*, l. c. in Proc. Zool. Soc. Lond.)

Occurs in Ceylon in the "Kottawah Forest, near Galle. Rare" (*Wade*)

In Mr. Moore's plate of this species and of *A. naradoides* in his "Lep. Cey." the numbering of the figures appears to have been reversed, nos. 1, 1*a* referring to *A. naradoides*, and no. 2 to *A. darana*.

I possess a considerable series of male *Amblypodias* from Ceylon, but do not find the differences in them that Mr. Moore defines between *naradoides* and *darana*. I have only seen one female from Ceylon, which is of the *darana* form. Colonel Swinhoe possesses a female from Madras, and I one from the Nilgiris, which are also *darana*. I believe *A. darana* to be a dimorphic female form only of the widely-distributed *A. anita*, Hewitson, which form may possibly be confined to South India and Ceylon.

774. **Amblypodia arracana**, Grose Smith.

Amblypodia arracana, Grose Smith, Ann. and Mag. of Nat. Hist., fifth series, vol. xx, p. 268 (1887).

HABITAT: Arracan Hill.

EXPANSE: 2·0 inches.

DESCRIPTION. "**UPPERSIDE**, *both wings* purple, exterior margins broadly dark brown. *Hindwing* with a large reddish-brown lobe at the anal angle. **UNDERSIDE**, *both wings* rufous, crossed from near the apex of the forewing to the middle of the inner margin of the hindwing by a brown-black line, between which and the base the space is more or less densely irrorated with the same colour. Half-way between the line and the outer margins is a brown-black band of minute maculæ, and another on the lower part of the outer margin of the *hindwing*."

"Near to *A. anata* [? *A. anita*, Hewitson, from Siam], but a larger and brighter insect." (*Grose Smith*, l. c.)

There is absolutely nothing in the above description to enable any one to identify the species, and not even the sex of the specimen described is stated.

Genus 126.—IRAOTA, Moore. (PLATE XXVII).

Iraota, Moore, Lep. Cey., vol. i, p. 101 (1881); id., Distant, Rhop. Malay., p. 258 (1885).

FOREWING, triangular, *exterior margin* slightly oblique and convex below the apex; *discoidal cell* somewhat fusiform, extending to more than half the wing; *costal* nervure curved, *first subcostal nervule* emitted at more than half before the end of the cell, *second* subcostal at one-third, and *third* subcostal at one-fifth before the end of the cell, third subcostal trifid [in the male only], *fourth* subcostal at more than one-half from below the third, *fifth* subcostal at one-half from below the fourth and terminating below the apex; *disco-cellular* nervules bent inwards close to the subcostal nervure; *upper radial* nervule from the subcostal end of the cell, *lower* radial from the angle close to the subcostal nervure; *second median* nervule at one-fifth, *first* median at one-third before the end of the cell; *submedian nervure* nearly straight. MALE with a tuft of hair on the underside of the posterior margin. HINDWING, short, produced and lobed at the anal angle; a slender *tail* from the end of the submedian nervure in the male, and a second tail from the end of the first median nervule in the female; *exterior margin* slightly sinuous; *costal nervure* much arched at the base; *first subcostal nervule* at nearly one-half before the end of the cell; *disco-cellular* nervules concave, acutely angled in the middle, *radial* nervule from their angle; *third median* nervule from close to the end of the cell, *first* median at nearly one-half before the end; *submedian nervure* straight, *internal* nervure recurved. MALE with a slightly indicated glandular space between the bases of the costal and subcostal nervures. BODY robust. *Palpi* porrect, second joint squamose, projecting slightly beyond the head, third joint slender. *Legs* squamose, femora slightly pilose beneath. *Antennæ* gradually thickened to tip." (*Moore*, l. c.)

In the forewing the costa is bent at the base, a little excised in the middle, for the rest straight; the apex is rounded; the outer margin is at first convex, then concave; the inner angle obliquely cut off inwardly; the inner margin straight; costal nervure ending opposite the apex of the discoidal cell; first subcostal nervule bent upwards near its base towards the costal nervure, which it does not quite touch; second subcostal with its base midway between the bases of the first subcostal and upper discoidal nervules; third subcostal long, originating from the subcostal nervure nearer to the apex of the wing than to the base of the upper discoidal; fourth subcostal (present in the male only) short, originating close to the apex of the wing; the terminal portion of the subcostal nervure reaching the margin below the apex of the wing in the male, at the apex in the female; lower discoidal nervule given off from the upper discoidal some little distance from the origin of the latter; discoidal cell broadest in the middle; no upper or middle disco-cellular nervules; lower disco-cellular originating from the lower discoidal immediately after its origin, upright, slightly concave, second median nervule originating a little before the lower end of the cell; submedian nervure straight. Hindwing with the costa evenly curved; the outer margin in the male straight, inwardly oblique. in the female the wing is broader and the outer margin is evenly rounded throughout, it is slightly scalloped in the male, more prominently so in the female; a large anal lobe; a somewhat short tail from the termination of the submedian nervure, which is often twice as long in the female as it is in the male, sometimes with a second longer tail at the termination of the first median nervule in the male; the female has always a second tail at the termination of the first median nervule, about half as long as the inner tail, and sometimes a third tail (the shortest of all) at the termination of the second median nervule; the costal nervure is much arched at base, curved throughout its length; the first subcostal nervule is also curved, given off rather close to the apex of the cell; the upper disco-cellular is slightly concave, outwardly oblique; the lower disco-cellular is also concave but less outwardly oblique than the upper; the second median nervule is given off very near to the lower end of the cell; the submedian nervure is slightly recurved, the internal nervure is long and highly recurved. The antennæ are more than half as long as the costa of the forewing. The eyes are naked. The male has a very small tuft of black hairs attached to the underside of the inner margin of the forewing just before the middle; the glandular space in the hindwing described by Mr. Moore is quite rudimentary.

Iraota and the preceding genus (*Amblypodia*, Horsfield) are structurally the most aberrant of the Indian *Lycænidæ* Messrs. Moore and Distant appear to have both overlooked the fact of the absence of the fourth subcostal nervule in the forewing in the female, Mr. Moore describes disco-cellular nervule s, while only one such vein is present, and Mr. Distant says nothing about the almost unique fact of the lower discoidal nervule originating from the upper discoidal.

LARVA, onisciform, smooth, the segments hardly constricted, head small, second segment small, the following segments rapidly increasing in width to the fifth, then gradually decreasing in width to the eleventh, then rapidly to the thirteenth. PUPA smooth, humped on the thorax, the abdominal segments anteriorly very broad, but very rapidly decreasing in width to the tail, which is acute.

Three species of *Iraota* occur within strict Indian limits, while two others have been recorded from the Malay Peninsula. The genus is of rather small extent, and occurs almost throughout India except the higher Himalayas and the desert tracts, in Ceylon, but not in the Andaman and Nicobar Isles, in Burma and the Malay Peninsula, in Java, Borneo, the Philippine Isles, and China. All the males have the disc and base of the wings most brilliant metallic blue on the upperside, the females are usually much duller, with a smaller patch of purple on the forewing; usually no patch or only a very small one on the hindwing, sometimes with no purple coloration at all on the upperside The underside of both sexes is highly variegated, castaneous with prominent silvery markings. I have only taken the butterflies on or near the Banian tree, on the leaves and small branches of which they alight. They have a very powerful and rapid flight, but soon settle after being disturbed.

Key to the Indian species of Iraota.

A. Male with one tail, female with two.
  a Hindwing, underside, with a large silvery irregular band below the costa at right angles to the body.
    775. I. TIMOLEON, India, China.
  b. Hindwing, underside with no large silvery band below the costa.
    776 I. MÆCENAS, India, Ceylon, China.
B. Male with two tails, female with three.
    777. I. ROCHANA, Burma, Java.

775. **Iraota timoleon,** Stoll. (PLATE XXVII, FIGS. 192 ♂, 193 ♀).

Papilio timoleon, Stoll, Suppl. Cramer, Pap Ex., vol v, pl. xxxii, figs. 4, 4D, *female* (1790); ***Amblypodia timoleon***, Horsfield and Moore, Cat. Lep. Mus. E I C, vol. 1, p. 44, n 67, pl. xii, figs 3, *larva*; 3*a*, *pupa* (1857); id., Marshall and de Nicéville, Butt. of India, vol 1, pl. ii, *larva* and *pupa* (1882), ***Iraota timoleon***, Moore, Proc. Zool. Soc Lond, 1882, p. 249, id, Staudinger, Ex Schmett, p. 279, pl xcvi, *male* (1888); ***Thecla nila***, Kollar, Hügel's Kaschmir, vol iv, pt 2, p 413 n 3, pl. iv, figs. 5, 6, *male* (1844).

HABITAT: China (*Stoll*), Bhutan (*Horsfield* and *Moore*), Kangra district (*Moore*), Masuri (*Kollar*), Dalhousie, Chumba, Dagshai, Masuri, Faizabad, Julpaiguri, Sikkim (rare both in the hills and in the Terai, occurs in July), Cachar, Pachmarhi, Orissa, Ganjam, Rutnagherry, Khandala, Poona, Nilgiris (rare, found only at low elevations).

EXPANSE: ♂, 1·5 to 1·8; ♀, 1·5 to 1·9 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* black, the lower basal area of the forewing and the disc of the hindwing rich deep metallic blue varying in extent in both wings. UNDERSIDE, *both wings* castaneous. *Forewing* with the following silvery markings:—a club-shaped mark in the cell touching the subcostal nervure and reaching to a little beyond the middle of the cell from the base; a large rounded spot on the disco cellular nervule, a discal series of four spots in pairs arranged in a straight line, divided by a streak which reaches the margin; a broad band of black extends across the middle of the wing from the base to almost the outer margin; the inner margin pale *Hindwing* with a very prominent broad silvery streak with irregular margins from the base of the wing (where it is narrow) to about the middle of the wing, placed below the costal nervure and at right angles to the body, a prominent well-separated silvery spot below the streak placed on the upper disco-cellular nervule, the rest of the wing more or less irrorated and marked with white streaks, an obscure submarginal broad yellowish band, the anal lobe black FEMALE. UPPERSIDE, *both wings* purplish-brown. *Forewing* with a lower discal patch of shining but non-metallic purple variable in size. *Hindwing* sometimes with a small irrorated patch of purple scales in the middle of the disc. In four specimens from Poona and Khandalla in Colonel Swinhoe's collection both wings on the upperside are as brilliantly metallic blue as in the male, and the colour is as extensive in the hindwing, and even more extensive in the forewing than in the opposite sex. UNDERSIDE, *both wings* similar to the male, but all the markings more prominent.

LARVA onisciform, smooth; ·9 of an inch in length; head very small; second segment rather large, third and fourth progressively larger, then gradually decreasing in width to the anal segment, constrictions between the segments very shallow; head pinkish, dorsal area pale pink shading off laterally into pale greenish, the anal segment entirely pale greenish; three series of annular dots on each side, no prominent markings whatever. PUPA very short and thick, dark brown, streaked with darker brown; head-case well marked; the abdomen very slightly constricted behind the thorax, posteriorly much rounded. Described from Horsfield and Moore's figures.

I. timoleon has almost precisely the same general range as *I. mæcenas*, Fabricius. Both occur in China and in many parts of India, but this species does not occur in Ceylon as does *I. mæcenas*. It presents the same apparent dimorphism in the female as that species.

Though these two species are apparently so distinct, I hold to the opinion that breeding will probably prove them to be but one variable species. The same opinion is held by Mr. W. Doherty, who writes of *I. mæcenas*, "an extremely variable species wherever I have found it." I think it by no means improbable that this variability is due to seasonal causes, and that it will hereafter be found that *I. timoleon* is the rains form and *I. mæcenas* the dry-season form of one species.

Figure 192 shews both sides of a male specimen from Chumba in the Western Himalayas, and figure 193 shews both sides of a female example from Jalpaiguri in the Western Dooars, both in my collection.

776. **Iraota mæcenas,** Fabricius.

Hesperia mæcenas, Fabricius, Ent. Syst., vol. iii, pt. 1, p. 271, n. 45 (1793) ; id., Donovan, Ins. China, pl. xxxix, fig. 2, *male* (1798) ; *Deudorix mæcenas*, Hewitson, Ill. Diurn. Lep., p. 25, n. 27 (1863) ; id., Butler, Cat. Fab. Lep. B. M., p. 180, n. 2 (1861) ; *Iraota mæcenas*, Moore, Lep. Cey., vol. i, p. 102, pl. xl, figs. 2, *male* ; 2a, *female* ; 2b, *larvæ* and *pupa* (1881) ; id., Doherty, Journ. A. S. B., vol. lv, pt. 2, p. 126, n. 123 (1886) ; *Deudorix timoleon*, var., Hewitson, Ill. Diurn. Lep., pl. viii, fig. 21, *female* (1863).

HABITAT : China (*Fabricius* and *Drury*) ; Hong-Kong (*Butler*) ; North India (*Hewitson*) ; Ceylon (*Moore*) ; Jhulaghât, eastern border of Kumaon (*Doherty*) ; Tanna or Nasik district, Egutpura, on the Thul Ghât, October ; Bombay, October (*Aitken*) ; Bhutan ; Sikkim, April, November and December (*Moller*) ; Mundi, Masuri, Dinapore, Bholahât, Calcutta, Orissa, Bangalore.

EXPANSE : ♂, 1·5 to 1·7 ; ♀, 1·6 to 1·9 inches.

DESCRIPTION : "MALE and FEMALE. UPPERSIDE, *both wings* violet-black, lower discal areas deep metallic-blue. UNDERSIDE, *both wings* dark chestnut-brown. *Forewing* with a white discoidal streak, a large disco-cellular spot, some transverse discal speckled spots, and lower submarginal lunular spots, posterior border also white. *Hindwing* with a basal slender white-speckled curved line, some sinuous lines below the cell, an indistinct discal and a submarginal lunular line, and slender marginal line, the discal and anal areas also minutely white-speckled ; anal lobe and spot beyond black."

"LARVA oniscıform, dorsally thickened, sloping obliquely at each end ; pale green, with rows of small circular spots and longitudinally intervening pale pink bands. Feeds on *Ficus religiosa*. PUPA short, very broad laterally ; purple-brown, with darker dorsal bands and segmental spots." (*Moore*, l. c.)

"The variety of the plate was drawn from a belief that there was only one species ; since then, I am inclined to think that there are two. First, the *I. timoleon* of Stoll (a wretched figure), the insect figured by Dr. Boisduval, and the *I. rochana* of Horsfield and Moore, which agree in having the hindwing broad at the anal angle, with two slender tails ; and secondly, distinct from them, the figure in Donovan's insects of China, the *Thecla nila* of Kollar, and the figure of the plate, which have the hindwing much more pointed at the anal angle and with one broad tail. The white spots on the underside of the hindwing of *I. mæcenas* are much less distinctly defined, the large white spot near the base is shorter, the double zig-zag white lines which cross the wing in *I. timoleon* (converging into one) are scarcely seen in *I. mæcenas*, and the slender white line which in *I. timoleon* connects the basal spot and the transverse lines is in *I. mæcenas* represented by a round spot." (*Hewitson*, l. c.)

With reference to the above remarks of Hewitson's, I consider that the *timoleon* of Stoll (a female), is distinct from the insect figured under that name by Boisduval (a female), the latter being the *rochana* of Horsfield (Moore figures the male). Mr. Hewitson does not seem to have appreciated the fact that the broad anal angle to the hindwing with two tails (sometimes three) are characters usually distinctive of the female, and that one tail (sometimes two) and a narrow hindwing denote a male. Again, I disagree with Mr. Hewitson in considering the *mæcenas* of Donovan (a male) and the *nila* of Kollar (a male) the same : they represent distinct species.

As I identify this species, there is no difficulty in distinguishing it ; on the underside of the hindwing in both sexes the prominent broad silvery subcostal streak at right angles to the body present in *I. timoleon*, Stoll, is absent, though usually its outline can be distinctly traced. It will be observed that Mr. Moore describes the colouring of both sexes on the upperside as the same. As far as my experience goes, this is not usually the case. I possess a single female only from Bangalore which has the rich metallic blue so characteristic of the male. All the numerous specimens I possess of that sex from other localities have the upperside shining (but not metallic) purple, and, instead of the hindwing being almost entirely of that colour, as in the Bangalore female, there is a small and obscure irrorated patch on the disc only. As this diversity in coloration occurs also in *I. timoleon*, I assume that the females of at any rate two species in this genus are dimorphic; if this were not the case it would be necessary to describe two new species to which I should be unable to assign corresponding males.

I have given above every locality that I can ascertain for this species. It will be observed that it occurs with *I. timoleon* in China, the Western Himalayas, Oudh, in Sikkim, Orissa, and Bombay. It occurs alone in Ceylon, Bangalore, Calcutta, and Bholahât. These localities are not numerous, and I shall expect to find hereafter that in them *I. timoleon* is found. The only specimen of an *Iraota* I possess from Ceylon is exactly intermediate between *timoleon* and *mæcenas*, and goes far to confirm my opinion that these two supposed distinct species are in reality but one variable species.

I append as a foot-note a description of *Iraola [Iraota] nila*, Distant.* If it is an *Iraota* at all, which I very much doubt, it belongs to this group, as it has two tails only to the hindwing, while the females of the other group have three tails. The name *nila* has already been used by Kollar for a butterfly of this genus.

777. **Iraota rochana**, Horsfield.

Amblypodia rochana, Horsfield, Cat. Lep. E. I. C., p. 108, n. 40 (1829); id: Horsfield and Moore, Cat. Lep. Mus. E. I. C., vol. i, p. 44, n. 68, pl. 1a, fig. 10, *male* (1857); *Iraota rochana*, Moore, Journ. Linn. Soc., Lond., Zoology, vol. xxi, p. 43 (1886); *Thecla timoleon*, Boisduval (*nec* Stoll), Sp. Gén., vol. i, pl. xxii, fig. 4, *female* (1836).

HABITAT: Mergui, Java.

EXPANSE: ♂, 1·41; ♀, 1·60 to 1·80 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* black. *Forewing* with an oblong patch of deep cyaneous-blue, or reflecting in a different light a beautiful sea-green lustre. *Hindwing* with a similar large area nearly circumscribed according to the outline of the wing, deeply notched at the base and separated by a narrow curved border from the posterior margin. UNDERSIDE, *both wings* dark reddish-brown, the hindwing covered with a shining bay reflexion; the anal area paler and clouded, in the forewing uniformly gray, and defined in the form of a regular arch in the hindwing; the surface of both wings bearing diversified marks of a beautiful shining silvery white, arranged in the following manner:—*Forewing* with a narrow white line, attenuated towards the base, extends near the inner boundary of the costal area about one-third of the wing; on the disc stands a very short transverse stigma; behind this follows a curved interrupted band of five wedge-shaped dots, of which the intermediate one is greatly lengthened and sagittiform, and, near the posterior margin, a gently curved striga of minute arcs. *Hindwing* has a delicate dash at the inner costal curve, then a very large oblong longitudinally-disposed spot with irregularly-defined edges, narrow at its basal extremity, enlarged into a rounded head as it approaches the middle of the costal margin, the exterior edge being deeply sinuated and the interior produced into a lengthened process stretching at right angles to the disc; behind this an irregular striga extending in an arcl across the entire surface at the interior boundary of the gray anal area, commencing near the middle of the costa with a large irregular dot, continued over the disc by four or five wedge-shaped marks, and then passing in two slightly diverging acutely flexuose lines to the inner margin; lastly near the hinder margin a double striga, the interior one undulated, enclosing a few oblong reddish-brown marks terminating near the external tail, all of a shining white tint, being succeeded by a large oblong transverse patch of a deep black colour and a stripe closely dotted with white, both which are regularly parallel with the posterior margin, while the anal appendage itself is covered by a large circular black spot, and two marks of the same colour, edged with white, are disposed along the oblique portion of the inner margin. *Body* brown above and hoary underneath. *Antennæ* uniformly brown to a short ferruginous tip. *Tails* black with a delicate medial line and a white extremity." (*Horsfield*, l. c.) FEMALE. UPPERSIDE, *both wings* dull purplish-black, unmarked. UNDERSIDE, *both wings* as in the male, except that the large silvery band on the hindwing is completely joined to the spot beyond, while in the male the two are well separated. The female has three tails to the hindwing, while the male has but two.

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* *Iraota nila*, Distant, Rhop. Malay., p. 462, n. 2, pl. xliv, fig. 24, *female* (1886). HABITAT: Malacca. EXPANSE: *Female*, 1·5 inches. DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* violaceous-blue; costal and outer margins of the *forewing*, and costal, outer and abdominal margins of the *hindwing* more or less brownish. UNDERSIDE, *forewing* pale ochraceous-brown, the area near the posterior angle greyish, the area beyond the discoidal cell more or less castaneous, preceded by a narrow white linear fascia extending from the first subcostal to the first median nervule; this fascia is followed by a series of five white spots, and these by a cluster of four apical spots of the same colour: two dark spots are placed beyond the lower two of the five white spots. *Hindwing* with about the upper half castaneous, the remaining area more or less ochraceous, shaded with castaneous, and marked with a series of white spots, most of which are shaded or margined with dark bluish; these spots are thus situated:—two subcostal, four (small) subapical, four discal, four (large, and much margined with bluish) on abdominal margin, and a marginal series of lineate spots; a black spot at anal angle, and a smaller black spot between the first and second median nervules. *Body* above more or less concolorous with the wings, beneath greyish. *Legs* greyish, mottled and streaked with brownish." (*Distant*, l. c.)

This species may be an *Iraota*, but I very much doubt it. As figured, the antennæ are much more than half as long as the costa of the forewing; the lower discoidal nervule is shewn as arising at the point of junction of equal middle and lower disco-cellular nervules in the forewing, a structural arrangement which is totally different from that seen in *Iraota*, in which no middle disco-cellular nervule exists; the inner tail is shorter than the outer, the reverse of this being the case in *Iraota*; and lastly the whole coloration and markings of the insect appear to me abnormal. It should probably form the type of a new genus.

My knowledge of this species is confined to a single female collected by Dr. J. Anderson in March on Elphinstone Island in the Mergui Archipelago, and now in the Indian Museum, Calcutta. I am quite unable to say how this specimen, which has been identified by Mr. Moore, differs from Mr. Distant's *I. boswelliana*, of which a description is given below.[*]

Genus 127.—Surendra, Moore. (PLATE XXVII).

Surendra, Moore, Proc. Zool Soc. Lond., 1878, p. 635; idem, id., l. c., 1879, p. 142; idem, id., Lep. Cey., vol. 1, p. 112 (1881).

"Allied to *Thaduka*, Moore Sexes dissimilar in colour above. FOREWING, short, broad; *costa* slightly arched, *apex* acute, *exterior margin* in the female very convex in the middle, less so in the male ; *hind margin* nearly straight. HINDWING, short, somewhat quadrate ; *anterior margin* nearly straight, *apex* angled ; *exterior margin* nearly straight anteriorly, truncate posteriorly, and in male with one tail situated at the end of the first median nervule, in the female with two tails, one at the first, the other at the second median nervule, anal lobe large. *Venation* similar to *Thaduka*, Moore. [This is incorrect, the venation differs considerably]. *Palpi* long, slender. *Legs* short *Antennæ* uniformly thickened" (*Moore*, l c in Proc. Zool. Soc. Lond., 1878). "Type, *Amblypodia quercetorum*, Moore, Horsfield and Moore, Cat. Lep. Mus. E. I C., vol. I, p. 42, n. 63, pl 1a, fig 7, *male* (1857)" (*Moore*, l. c in Proc Zool Soc Lond., 1879).

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[*] *Iraota boswelliana*,[*] Distant, Rhop. Malay., p 258, n. 1, pl. xxii, fig 23, *female* (1885); id, Staudinger, Ex. Schmett., p 279, pl xcvi, *female* (1888). HABITAT: Penang, Singapore EXPANSE *Male*, 1·4 to 1·5; *female*, 1·8 inches. DESCRIPTION: "MALE UPPERSIDE, *both wings* dark fuscous *Forewing* with a large patch of dark bluish scales occupying the base of the cell and extending along the inner half, but not reaching the outer margin. *Hindwing* with a very large and similar dark bluish patch occupying the whole discal area; *tail* and the angulation at the apex of the second median nervule dark fuscous, with the apex greyish-white. UNDERSIDE, *both wings* warm brownish, shaded with purple. *Forewing* with seven white spots, situated one largest and elongate in the cell, one at the end of the cell, and five in a somewhat curved series between the end of the cell and the outer margin, of which the third is the largest and extends outwardly; and a submarginal, somewhat obscure, macular series of small greyish spots; towards the inner margin the ground-colour becomes much paler. *Hindwing* with the basal half dark purplish, bounded by a medial silvery white fascia, which is widest at the abdominal margin and contains some irregular purplish markings; the basal dark purplish area also contains two silvery white fasciæ, the first short and costal, the second very large, extending from near the base of the abdominal margin to the apex, with a concave depression above and a narrow medial continuation beneath, which reaches the medial silvery fascia; beyond this the colour is ochraceous, with some purplish marginal spots, bordered with white near the apex, and a broad bluish marginal fascia bordered with white, extending from about the third median nervule to the anal angle, and containing a darker spot at either end. *Body* above and beneath more or less concolorous with the wings *Legs* pale brownish. FEMALE. UPPERSIDE, *both wings* pale uniform ochraceous-brown. *Hindwing* with the costal area paler, *tails* and angular [? anal] prolongation darker brown, with their apices greyish. UNDERSIDE, *both wings* as in the male, but brighter in hue and markings."

"Although the female is decidedly larger than the male, it is probable, if a large series could be measured, that the diversity is not so great as the above dimensions advocate. The male also possesses a more elongate appearance than the female."

"Considerable confusion has ensued by several distinct species having for a long time been placed under one name Thus Mr. Hewitson (Ill. Diurn Lep, p. 25 (1869) has not only considered *I. timoleon*, Stoll, *I. rochana*, Horsfield, and *I. lazarena*, Felder, as one species, but has also included the species described here, as is evident from the mention of Penang as a locality. In this opinion he has been copied by Mr. Kirby (Cat. Diurn Lep., p. 418 (1871). All these species are, however, clearly distinct and easily determinable by the emphatic markings on the underside of the wings, which, in the Rhopalocera, are the surest guide for specific difference." (*Distant*, l. c.)

[*] "In naming this species I have taken a hint from Dr. Johnson. The great lexicographer once remarked to his future biographer, *à propos* of a moth which fluttered into a candle, 'That creature was its own tormentor, and I believe its name was Boswell.' This is probably the whole condensed 'entomological' observation of Dr. Johnson, and as such may be remembered." (*Distant*, l. c.)

In the forewing of the typical species the costa is regularly arched, more so in the female than in the male, the apex acute, the outer margin at first concave, then strongly convex, especially so in the female, the inner margin slightly sinuous ; costal nervure ending opposite the apex of the cell ; second subcostal nervule with its base equi-distant between the bases of the first subcostal and upper discoidal nervules ; the third subcostal nervule is short, originating nearer the apex of the wing than of the cell , disco-cellular nervules upright, concave, the middle a little shorter than the lower, given off from the upper discoidal near to its base ; lower disco-cellular meets the median nervure at an equal distance from the base of the second median nervule, as does *the middle disco cellular from the base of the upper discoidal nervule ;* submedian nervure straight In the hindwing the costa is much arched at base, then nearly straight to apex in the male, slightly arched in female , outer margin in male regularly convex to tail, then *oblique and deeply excavated to anal lobe, in the female it is concave to the base of the* outer tail , abdominal margin excavated above the anal lobe, then convex to the base of the wing , the first subcostal nervule is given off rather near to the apex of the cell ; the disco-cellular nervules *are almost straight, of equal length,* and *slightly outwardly oblique ; the* second median nervule is given off exactly opposite the lower end of the cell ; the submedian nervure is straight, the internal nervure is at first straight then strongly bowed outwardly. The male *has no secondary sexual characters, and it has a somewhat short tail at the termination of* the first median nervule, the female possesses a second tail of equal length at the termination of the second median nervule Both sexes have a very large anal lobe. The eyes are naked.

Mr. Doherty has recently added two very interesting species (*S amisena*, Hewitson, and *S. florimel*, Doherty) from Burma to this genus. The male of *S amisena* has a much shorter tail and a smaller lobe than in *S quercetorum*, both the tails and the lobe of the female are also smaller. *S florimel* is still more aberrant neither sex possesses *tails* or a *lobe*, the hindwing being only toothed or angled at the apex of the second median nervule. Both these species are perfectly distinct and easily recognised

Three species in addition to the type species have been described from strictly Indian limits : specimens of all of them are in my possession. The distinguishing characters which have been given by various authors to discriminate between them and the parent form, *S quercetorum*, Moore, are, in my opinion, so slight and trivial—and, moreover, are such as would be likely to occur in a widely distributed species such as is *S quercetorum* occurring in great variations of climate—that I hold very strongly to the belief that they represent but one somewhat variable species, which should be known as *S. quercetorum* The form which occurs in Sikkim and Assam averages considerably larger than examples from South India, Ceylon, Burma, and the Andaman Isles In almost all localities the hindwing is sometimes marked on the upperside in the male with a patch of purple in the middle this patch is, however, sometimes absent. The prominence of all the markings of the underside as well as the shade of the ground-colour is also variable Viewed as a single variable species, *S quercetorum* occurs almost throughout the outer ranges of the Himalayas at low elevations, in Assam, Burma, Orissa, Madras, Bombay, the Nilgiri, Shevaroy and Pulni Hills, in Trichinopoly, Ceylon, and the Andaman Isles. The following key simply gives the hitherto recorded localities for the different supposed distinct species of this group, and in the descriptions of these the habitat headings contain those localities only which have been recorded for them by various authors *S. amesina*, Hewitson, is abundantly distinct , the male may be known by having a smaller tail and lobe than *S. quercetorum* , the female is glossed with steely-purple on the upperside, a very abnormal feature in this genus. *S. florimel*, Doherty, is even more distinct. The male is much more richly purple-blue than the other species of the genus; the female is fuscous on the upperside as in the same sex of *S. quercetorum*; both sexes, however, have no tail or anal lobe whatever, thus entirely departing from the normal structure of the other species of the genus. The markings of the underside of both sexes of all the species of the genus *Surendra* are highly peculiar and characteristic, and by them any species can at once be recognised; they are somewhat approached, however, by *Zinaspa todara*, Moore, and *L. distorta*, de Nicéville

Mr. Doherty notes that "*Surendra*, Moore, *Apporasa*, Moore, and a number of *Arhopalas* have hemispherical eggs covered with white globular tubercles and triangular reticulations, six of which radiate from each tubercle. Somewhat similar reticulation occurs in some *Lycæninæ*. I must apologise for a former statement* that *Surendra* must be placed in the *Theclinæ* on the strength of the egg. At that time I was acquainted only with the spiny form of egg, which is the usual one in the Indian species of this group." (Journ. A. S. B, vol. lviii, pt. 2, p. (1889)

The genus occurs in the Himalayas, Southern and Eastern India, Burma, Ceylon, the Malay Peninsula, and in the Islands of Nias and Java. The transformations of no species are known, but Mr. P. W. Mackinnon has seen the female of *S. quercetorum* laying eggs on a species of *Mimosa* in the Dehra Dun.

Key to the Indian species of Surendra.

A. Male, hindwing with one tail, female with two.
    a Female, upperside, both wings dull brown, forewing with the middle of the disc paler, both sexes, tails long.
        a¹. Of large size.
            778. S. QUERCETORUM, Western Himalayas, Assam.
        *b*¹. Of smaller size
            779. S. BIPLAGIATA, Madras.
            780. S DISCALIS, Ceylon.
            781. S. LATIMARGO, Andaman Isles.
    b. Female, upperside, both wings strongly glossed with lilac-blue; both sexes, tails shorter.
            782. S. AMISENA, Burma, Singapore, Nias.
B. Both sexes, hindwing with no tail, with a tooth only at end of second median nervule.
            783. S. FLORIMEL, Burma.

778. **Surendra quercetorum**, Moore. (PLATE XXVII, FIGS. 194 ♂, 195 ♀).

Amblypodia quercetorum, Moore, Horsfield and Moore, Cat. Lep Mus E. I. C, vol. i, p 42, n. 63, pl iii, fig. 7, *male* (1857); id, Hewitson, Cat. *Lycænidæ* B. M., p 14, n 63 (1862); id., Staudinger, Ex Schmett, p. 281, pl xcvi, *male* and *female* (1888); *Surendra quercetorum*, Moore, Proc Zool Soc Lond, 1882, p. 251; id., Doherty, Journ. A. S B., vol. lv, pt. 2, p 130, n 151 (1886), *Amblypodia vivarna*, Hewitson (*nec* Horsfield), Cat. *Lycænidæ* B. M., pl vii, fig 76, *female* (1862).

HABITAT: Sylhet, N India, Kangra Valley (*Moore*); Sylhet (*Hewitson*); Bagheswar, Lower Ramganga, Gori and Kali valleys, 2,000 to 4,000 feet, Kumaon (*Doherty*).

EXPANSE: ♂, 1·62; ♀, 1·55 inches (*Hewitson's figure*).

DESCRIPTION: MALE. "UPPERSIDE, *both wings* dark brown, the middle of the wings deep purple. *Forewing* with the anterior and posterior angles pointed. *Hindwing* with the anal angle elongated. UNDERSIDE, *both wings* brown. *Forewing* with a series of small dark spots near the exterior margin, then an undulating line, and towards the base some indistinct spots. *Hindwing* with a dark brown fascia running from the anterior angle across to middle of abdominal margin; an undulating dark line near the exterior margin, and two small whitish elongated spots near the anterior margin." (*Moore*, l. c. in Cat. Lep. Mus. E. I. C.) FEMALE. UPPERSIDE, *both wings* purplish smoky-brown varying in intensity of shade. *Forewing* with the disc and inner margin often paler than the rest of the wing. *Hindwing*, tails brown, sometimes tipped with white. UNDERSIDE, *both wings* as in the male. Described from Sikkim specimens.

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* "The egg clearly shows that the genus [*Surendra*] is near *Thecla*, and remote from *Amblypodia*." (*Doherty*), Journ A. S B, vol. lv, pt 2, p 130, n. 151 (1886).

Mr. Hewitson describes a "Variety *a*" from Sylhet as follows :—"MALE. UPPERSIDE, *forewing* less pointed at the apex, the blue colour much lighter, the margins rufous-brown. *Hindwing* uniform rufous-brown. FEMALE. UPPERSIDE, *both wings* rufous-brown. *Forewing* with a longitudinal ferruginous spot in the middle. The female figured is very likely a variety; it is probably for the most part of a uniform rufous-brown "

"On the underside *S. quercetorum* differs from *S vivarna*, Horsfield, chiefly in the obscurity, or absence altogether, of the white spots which constitute the medial band of the hindwing of that species" (*Hewitson*, l c)

I observe the same tendency to variation in Sikkim specimens as Mr Hewitson has noted in examples from Sylhet The one doubtfully constant character which I can find to separate this species from those which follow is the larger size of *S quercetorum*. In Sikkim it is a common species, occurring both in the hills and in the Terai, at any rate in April and October, but probably throughout the year. Colonel A M. Lang took a single specimen on 10th October at Khairna, Kosi Valley, 3,100 feet, Kumaon Its occurrence in the Kangra Valley is a little doubtful, I think, though Mr. P. W Mackinnon has taken it in the Dehra Dun in August. It was obtained by the Yunan expedition in Upper Burma, and I possess a specimen taken by Major C. T Bingham in Pegu in June, and another from Rangoon in July. It is a little remarkable that I have always caught many more females than males of this species in Sikkim. The markings of the underside are strongly protective, and resemble dead leaves.

Figure 194 shows both sides of a male specimen, figure 195 shows both sides of a female example, both from Sikkim, and in my collection.

Mr. Distant does not include any species of the genus *Surendra* under that name (though he gives *S. amisena* as a *Rapala*) in his "Rhopalocera Malayana," though Mr. Hewitson gives a variety of *S. vivarna*, Horsfield, from Singapore. To enable this form to be distinguished if again found, I give a full description of it as a foot-note *

779. **Surendra biplagiata,** Butler.

S. biplagiata, Butler, Proc Zool. Soc Lond, 1883, p. 147, n. 9, pl xxiv, fig 12, *male*.

HABITAT. Madras

EXPANSE: ♂, 1·35 inches.

DESCRIPTION: "MALE. Near to *S discalis*, Moore, but easily distinguished by having no violet patches on the UPPERSIDE of the *hindwing*, and by the grey colouring of the UNDERSIDE, upon which the markings are extremely indistinct.' (*Butler*, l. c)

I have seldom seen a worse modern illustration of a butterfly than the one given of this species. The colouring is exaggerated, the outline is incorrect though the figured specimen is a male, two tails are shown, the anal angle of the hindwing is rounded, and there is no anal lobe. In Colonel Swinhoe's collection are two males from Madras of that which I suppose to be this species, and which have been so named by Mr. Moore. They both possess violet patches on the upperside of the hindwing. This, however, is a character of no importance; being almost everywhere eminently variable. The underside is certainly greyer, and the markings a little less distinct than in typical specimens from Sikkim, characters which are probably due to a dry habitat.

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* *Surendra vivarna*, Horsfield *Amblypodia vivarna*, Horsfield, Cat Lep E I Co, p 99, n. 31 (1829); id., Hewitson, Cat. *Lycænidæ* B M, p 13, n. 81, pl vii, figs 73, 77, *male*, 75, *female* (1862). HABITAT: Singapore (*Hewitson*), Java (*Horsfield*) EXPANSE. *Male* and *female*, 1·00 to 1·33 inches DESCRIPTION: "MALE UPPERSIDE, *both wings* deep blackish brown *Forewing* with a large oblong brilliant cyaneous patch. *Hindwing* with a triangular patch of the same colour, varying in both wings according to the direction of the light to obscure purple, being separated from the margins by a regularly defined border of the ground colour, which is broader at the inner margin of the hindwing, where the anal angle excavation has a grayish tint. UNDERSIDE, *both wings* brown with a glaucous tint, the surface being also marked with a few clouds inclining to a purple colour, an irregularly arched and flexuous streak, consisting of delicate lunules in close succession, passes through both wings. in the forewing it commences at the same distance from the costa and the inner margin, and after a short curve at each extremity forms a large arch in the middle area tending towards the posterior margin; in the hindwing it winds over the surface in a serpentine course, and the lunules are individually edged externally with pale sulphureous yellow *Forewing* has further two short transverse lituræ in the middle area before the disc, three obsolete marginal dots near the medial portion of the costa, and finally a row of dots parallel with the posterior margin *Hindwing* has near the base a lunule edged with yellow, and an obsolete waving litura disposed in succession as a striga then, behind the curved medial striga, a series parallel with the posterior margin, commencing at the outer apical angle with four or five successive obsolete dots, followed by as many lunules edged with yellow and continued in a flexuose direction to the inner angle, and, finally, at the anal termination of the wing, three semilunar marks, faintly dotted with yellow, extending from the outer tail to the inner edge of the anal appendage. FEMALE. UPPERSIDE, *both wings* uniformly dark brown. UNDERSIDE, *both wings* as in the male. *Body* brown above and gray underneath. *Antennæ* have a brown tint to the ferruginous tip, the rings having a very faint grayish discoloration. *Tail* two, the inner one, which exceeds the other in length, is brown with a grayish tip." (*Horsfield*, l. c)

Mr. Hewitson (l. c) describes a "Variety *a*" of this species from Singapore as follows :—"With the forewing somewhat more pointed at the apex the transverse band on the underside of the forewing straighter and less undulated. The anal angle of the hindwing irrorated with silvery-blue."

780. **Surendra discalis**, Moore.

S. discalis, Moore, Proc. Zool. Soc. Lond., 1879, p. 142; idem, id., Lep. Cey., vol. 1, p. 113, pl. xliv, figs. 1, *male* 1*a*, *female* (1881).

HABITAT: Ceylon.

EXPANSE: ♂, ♀, 1·3 inches.

DESCRIPTION: "Differs from *S. vivarna*, Horsfield, in having a broader [black] border in the male. The wings are of the same shape as in *S. latimargo*, Moore. FEMALE. UPPERSIDE, *both wings* ochreous-brown slightly violet-tinted, with a prominent pale ochreous discal area. UNDERSIDE, *both wings* greyish basally, ochreous-brown externally, with dark sinuous markings." (*Moore*, l. c. in Proc. Zool. Soc. Lond.)

I possess a considerable series of this species from Ceylon. It is simply a small form of *S. quercetorum*; it has absolutely, as far as I can see, no other character except its small size by which it can be distinguished from that species. The ochreous patch on the upperside of the forewing in the female is very variable, in some specimens not differing at all from the pale patch seen in *S. quercetorum*. In Ceylon it occurs at "Matale. Garden hedges. August" (*Hutchison*). "Kandy and Galle. Common" (*Wade*). "Kandy and North Matale. Difficult to capture, from its habit of keeping within the protection of the thorny *Acacias*" (*Mackwood*).

781. **Surendra latimargo**, Moore.

S. latimargo, Moore, Proc. Zool. Soc. Lond., 1879, p. 142; *S. quercetorum*, var. *latimargo*, Wood-Mason and de Nicéville, Journ. A. S. B., vol. xlix, pt. 2, p. 235, n. 55 (1880).

HABITAT: Andamans.

EXPANSE: ♂, 1·2 to 1·4; ♀, 1·40 to 1·55 inches.

DESCRIPTION: "Near to *S. vivarna* (*Amblypodia vivarna*, Horsfield, Catal. Lep. E. I. C., 1829, p. 99), from Java. Differs in being smaller, with slightly shorter wings, the hindwing less convex at the anterior angle and outer margin. MALE. UPPERSIDE, *both wings* have a much broader brown outer border, and the *hindwing* has scarcely any blue on the disc. UNDERSIDE, *both wings* purplish fawn-colour, the outer transverse sinuous line darker, and the inner zigzag line with less white border. FEMALE differs also in being of a dark vinous-brown above, with a slightly paler discal area on the forewing, and of a dark fawn-colour beneath." (*Moore*, l. c.)

"Is *A. quercetorum* itself more than a local race or variety of *A.* [=*S.*] *vivarna*, Horsfield, from Java?" (*Wood-Mason* and *de Nicéville*, l. c.)

Not uncommon in the Andamans. It averages a little larger, perhaps, than the three species which precede it. I think it would be absolutely impossible for any one to separate the specimens of the four above-described Indian species of *Surendra* into their respective species if the specimens I possess of them had their labels removed and were mixed up. Even size is not sufficient to distinguish *S. quercetorum*, Moore, as I possess some specimens of that species from Sikkim, which are quite as small as any *Surendra* from South India, Ceylon, or the Andamans.

782. **Surendra amisena**, Hewitson.

Amblypodia amisena, Hewitson, Cat. *Lycænidæ* B. M., p. 13, n. 60, pl. vii, figs. 74, 78, *female* (1862); id., Kheil, Rhop. Ins. Nias, p. 33, n. [illegible]3 (1884); *Rapala amisena*, Distant, Rhop. Malay., p. 277, n. 1, pl. xxiii, fig. 13, *male* (1885); *Surendra amisena*, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p.   (1889).

HABITAT: Mergui, Myitta, Burma (*Doherty*); Singapore (*Hewitson* and *Distant*); Nias Island (*Kheil*).

EXPANSE: ♂, 1·4 to 1·5; ♀, 1·4 to 1·5 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark violaceous-blue. *Forewing* with the costal and outer margins (very broadly at the apex) dark fuscous. *Hindwing* with the costal and outer margins (the first broadly, particularly at apex, and the second narrowly) dark fuscous, the abdominal margin somewhat paler fuscous. UNDERSIDE, *both wings* dark brownish, the markings dark fuscous. *Forewing* with a linear spot near the middle and one at the end of the cell, a waved and sinuated linear fascia between the end of the cell and the apex of the wing, preceded by a subcostal linear spot situated between the first and second subcostal nervules, and a submarginal series of small spots placed between the nervules. *Hindwing* with a short broken linear fascia near the base, commencing at the costal nervure and terminating near the submedian nervure, a much-waved and sinuated linear fascia more or less outwardly margined with greyish crosses the wing beyond the end of the cell; a submarginal series of spots (largest above the third median nervule) placed between the nervules, and three metallic greenish marginal spots, more or less centred with black, near the anal angle. *Tail* fuscous, with the apex greyish-white. *Body* and *legs* more or less concolorous with the wings. *Antennæ* with the extreme apex ochraceous" (*Distant*, l. c.) FEMALE. "UPPERSIDE, *both wings* dull lilac-blue. *Forewing* with the margins suffused with brown. *Hindwing* rufous-brown, glossed with blue in the middle. UNDERSIDE, *forewing* with the transverse band different from that of *A.* [=*S.*] *vivarna*, Horsfield, without the angular bends of that species, and gradually curved outwards to the middle. *Hindwing* with the anal angle irrorated with dull light blue with a lunular black spot between the tails." (*Hewitson*, l. c.)

Mr. Doherty has given the following note on the specimens of this species he obtained in Burma:—"The female agrees well with Hewitson's figure, except that the transverse discal line of the forewing on the underside is more irregular, and like that of his figure of '*Amblypodia*' *vivarna*, Horsfield. The male differs from Distant's figure in being more angulate, the forewing being acuminate and slightly falcate. The blue area on the upperside varies greatly, sometimes occupying less than a third of the forewing and a sixth of the hindwing, sometimes more than half of the forewing and a third of the hindwing. In this species the male has a short tail at the end of the first median nervule, but scarcely more than an angle at the end of the second median nervule; the anal lobe is much smaller than in *S. quercetorum*, Moore. The female has two tails, both slender, the outer the shorter."

There can be no difficulty in recognising this species. In both sexes the tails are smaller in every way (breadth and length) than in *S. quercetorum*, Moore, and the female being glossed with purple on the upperside is a character quite unique in the genus, as far as I am aware. It is very distantly removed from the genus *Rapala*, Moore, in which Mr. Distant placed it, the male having no secondary sexual characters, while *Rapala* has them, and the female having two tails, while all *Rapalas* have but one.

783. **Surendra florimel,** Doherty.

S. florimel, Doherty, Journ. A. S. B., vol. lviii, pt 2, p. (1889).

HABITAT: Wagung, Tavoy District, Burma.

EXPANSE: ♂, 1·4; ♀, 1·5 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* rich purple-blue. *Forewing* with the blue area occupying nearly half the surface, extending from the costal nervure to the inner margin, outwardly angled at the third median nervule. *Hindwing* with the blue area extending from just below the second subcostal nervule to the submedian nervure, leaving the upper part of the discoidal cell dark; a narrow black marginal line. UNDERSIDE, *both wings* with the ground-colour light fuscous-brown as in *S. amisena*, Hewitson, but with the cell and disc of the forewing much darker, and the basal and apical half of the hindwing deep violet-brown. *Forewing* with a short oblique dark streak in the middle of the cell, a larger one across its end, and one or two costal streaks; a transverse discal line of joined lunules (separated in *S. amisena*) from the second subcostal nervule to below the first median nervule, projecting outwardly below the lower discoidal nervule; apex widely, and outer margin narrowly pale fuscous. *Hindwing* with the transverse discal fascia consisting of a broken dull silvery line on a deep brown ground: an obscure outer-discal transverse band pale on the dark apical and dark on the pale abdominal ground; an obscure metallic patch in the first median interspace. FEMALE. UPPERSIDE, *both wings* dull brown. *Forewing* with a slightly paler area in the middle of the disc. UNDERSIDE, *forewing* with the dark area of the male confined to the neighbourhood of the median interspaces on the disc. *Hindwing* with the dark area of the male reduced to a band across the wing from the apex to the abdominal margin, crossing the end of the cell; a distinct whitish spot basally between the costal and subcostal nervures, the inner transverse line united, crossing the dark area subapically; the outer one consisting of pale lunules bordered, especially outwardly, by a dark band, in which there are two dark subapical spots, the second larger."

"This species has the hindwing strongly angled at the end of the second median nervule, and quite straight thence to the anal angle; there is no trace of tails or lobes. The forewing is not distinctly falcate in either sex. The egg and venation are as in *S. amisena*, Hewitson, and *S. quercetorum*, Moore. It is a very distinct species, and the male is very richly coloured."

"One male and several females taken on the pass near Wagung, Tavoy district, at 1,500 feet altitude." (*Doherty*, l. c.)

This also is a most distinct species, the absence of tails and of an anal lobe to the hindwing, and the rich blue coloration of the male on the upperside being characters which are not found in any other species in the genus.

Genus 128.—APPORASA, Moore.

Apporasa, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 38 (1884).

"FOREWING, differs from *Thaduka*, Moore, in having the *exterior margin* biangulated and produced outwards below the apex. HINDWING, has the *costa* longer, arched at the base, and produced to an upward angle at the apex; the *exterior margin* is deeply scalloped; it has also three shorter *tails*. *Palpi* long, porrect, second joint extending two-thirds beyond the eyes, third joint also long and slender being half the length of the second; *antennæ* stouter and blunt at tip." (*Moore*, l. c.)

Superficially this genus appears to be a close ally of the next genus *Thaduka*, Moore. The type and only known species, *A. atkinsoni*, Hewitson, is of about the size of *T. multicaudata*, Moore. The forewing has two blunt rounded dentations below the apex, immediately below which again it is almost entire; the hindwing is very dentate, but judging from the figure alone, cannot properly be said to be tailed, nor has it the large anal lobe present in *Thaduka*. The outline of the costa of the hindwing of *Apporasa* is quite different from that of *Thaduka*. The general style of markings of *Thaduka* and *Apporasa* on both surfaces is the same.

Since the above was written, I have been enabled, through the kindness of Mr. W. Doherty, to examine a pair of this species. The hindwing has a distinct spatulate tail from the end of the first median nervule, which is not shown in Hewitson's figure; the anal lobe is small.

784. Apporasa atkinsoni, Hewitson.

Amblypodia atkinsoni, Hewitson, Ill. Diurn. Lep., p. 145, n. 99, pl. iib, figs. 48, 49 (1869); *Apporasa atkinsoni*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 38 (1884); *Mahathala* (*Apporasa*) *atkinsonii*, Doherty, Journ. A. S. B., vol. lviii, pt. 2, p. (1889).

HABITAT: Moulmein (*Hewitson*); Myitta, Tenasserim Valley (*Doherty*).

EXPANSE: ♂, 1·5; ♀, 1·75 to 1·80 inches.

DESCRIPTION: "UPPERSIDE, *both wings* rufous-brown, darkest on the forewing, the wings dentated, marked with blue from the base to beyond the middle. *Forewing* with the costal margin spotted with white. UNDERSIDE, *both wings* pale brown irrorated with darker colour. *Forewing* dark brown from the base to beyond the middle, the cell crossed by four white lines followed by two similar lines of the same colour, a submarginal band of lunular spots, three oblique white lines near the costal margin. *Hindwing* with its costal margin sinuated, the apex projecting, a triangular brown spot on the costal margin near its base, two black lines at the end of the cell, and a zigzag submarginal black line." (*Hewitson*, l. c.)

"The genus *Apporasa*, Moore, and the species *atkinsonii*, Hewitson, were both I believe founded on a single specimen of uncertain sex with the tails broken off. I took one male and two females of the species near Myitta, having tails greatly resembling those of *Mahathala*, Moore. From that genus they differed in the less acuminate apex of the hindwing, in the egg (which was covered with triangles and tubercles instead of quadrangles and spines, a difference which seems of but small importance in this group), and in the more undulate margin of the hindwing. On this last account the genus might be retained. But the insect has, when sitting on a tree trunk, a marvellous resemblance to a patch of lichen, and the irregular outline adds to that effect. Mimicry of this sort is a sign of great flexibility of structure, and such genera must be judged by severer canons than others, so perhaps *Apporasa* had better be sunk in *Mahathala*." (*Doherty*, l. c.)

Although *A. atkinsoni* possesses a tail similar to *Mahathala ameria*, Hewitson, and the costa of the hindwing is also somewhat similar, *yet it is, I believe, in reality nearer to Thaduka multicaudata*, Moore, than to that species. It has the costa of the forewing as arched as in *T. multicaudata* (considerably more so than in *M. ameria*), and the markings of both surfaces are very similar, therein differing very markedly from *M. ameria*. *A. atkinsoni* has a few metallic green scales scattered over the wings on the underside as in *T. multicaudata*, a feature entirely wanting in *M. ameria*. The male of *A. atkinsoni* is a little smaller than the female, is very similarly marked on both surfaces, but has the purple coloration of the hindwing on the upperside more restricted to the disc, which is a reversal of the usual difference of markings in the sexes of butterflies of this group. Hewitson's figure shows the blue coloration of the upperside much too pale, it is really a rather dark purple.

Genus 129.—THADUKA, Moore. (PLATE XXVII).

Thaduka, Moore. Proc. Zool Soc. Lond., 1878, p. 836.

"Allied to *Mahathala*, Moore. FOREWING, short, broad; *costa* very convex at base, *apex* acutely angled; *exterior margin* erect, scalloped; *posterior angle* lobular; *hind margin* same length as the costal, concave in the middle. HINDWING, short, broad; *anterior margin* convex, *apex* and *exterior margin* very convex, sinuous, with three prominent *tails*, the middle one longest, *anal lobe* large; *abdominal margin* very concave above anal lobe. Venation similar to *Mathahala* (*Amblypodia ameria*, Hewitson). BODY short, stout. *Antennæ* uniformly thickened to the end. *Palpi* slender. *Legs* short." *Eyes* naked. (*Moore*, l. c.)

This is a very aberrant genus, and, as far as I can ascertain, may be known from all others occurring in India (except some species of *Iraota*, Moore) by having three very distinct tails besides a large anal lobe to the hindwing. A single species of *Thaduka* only is known up to date, and it occurs in Upper Tenasserim.

785. Thaduka multicaudata, Moore. (PLATE XXVII, FIG. 196 ♀).

T. multicaudata, Moore, Proc. Zool. Soc. Lond., 1878, p 836, pl lii, fig. 7, *female*.

HABITAT: Taoo, 3000-5000 feet, Upper Tenasserim.

EXPANSE: ♀, 1·62 to 1·90 inches.

DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* purple-black, basal areas bright smalt-blue. *Body* and abdominal border greyish, thorax blue. UNDERSIDE, *both wings* dark vinous-brown. *Forewing* with short subbasal, medial, and an entire discal, purple-black maculate bands, and an outer marginal series of lunules. *Hindwing* with three irregular curved transverse purplish-black maculate bands, and indistinct marginal lunules; a narrow metallic-green lunule above the tails." (*Moore*, l. c.)

The dull metallic-green markings on the underside are more profuse than described by Mr. Moore; there are five increasing spots in the discoidal cell of the forewing, and numerous spots scattered over the hindwing, with a prominent lunular band on the outer margin from the anal angle to the discoidal nervule. I have seen but two specimens of this species, both females, taken by Major C. T Bingham in the Meplay Valley and Upper Thoungyeen Forests, Burma, in February and April. The male has yet to be discovered. It appears to be an extremely rare species, with a very limited range.

The figure shows both sides of a female example from the Meplay Valley in my collection.

Genus 180.—ARHOPALA, Boisduval. (FRONTISPIECE AND PLATE XXVII).

Arhopala, Boisduval, Voy. Astr., Lép, p. 75 (1832). *Narathura*, Moore, Proc. Zool. Soc Lond, 1878, p. 835; id., Distant, Rhop Malay., p. 259 (1885); *Nilasera*, Moore, Lep Cey., vol. i, p 114 (1881); *Panchala*, id., Proc. Zool Soc Lond, 1882, p. 251; id., Distant, l c, p 272, *Satadra*, Moore, Journ A. S. B., vol. liii, pt. 2, p 38 (1884), *Darasana*, id, l c, p 42, *Flos* and *Iois*, Doherty, Journ A S. B, vol. lviii, pt. 2, p (1889); *Amblypodia*, auctorum (*nec* Horsfield)

WINGS broad. FOREWING, *costa* nearly straight, moderately arched or strongly arched, often distinctly waved towards the apex between the terminations of the nervules; *apex* acute, the acuteness varying in intensity; *outer margin* sometimes straight, sometimes regularly convex, sometimes strongly convex, sometimes slightly concave below the apex, then strongly convex; *inner* margin slightly emarginate in the middle; *costal nervure* short, but varying slightly in length, never reaching to opposite the apex of the discoidal cell; *first* and *second subcostal* and *upper discoidal nervules* with their bases about equi-distant, *third subcostal* nervule rather short, arising nearer to the apex of the wing than to the apex of the cell, varying in length; *middle disco-cellular* nervule given off some little distance beyond the origin of the upper discoidal, very short, straight, outwardly oblique*; *lower* disco-cellular nervule four times as long as the middle disco-cellular, straight, slightly inwardly oblique; *second median* nervule given off some little distance before the lower end of the cell; *first median* nervule curved, bowed downwards soon after its origin, the median nervure angled upwards beyond the point where the first median nervule is given off; *submedian nervure* straight. HINDWING, sometimes entire, sometimes waved, sometimes furnished with a short tail at the termination of the first median nervule, sometimes this tail considerably longer, sometimes there is an additional very short tooth or tail at the termination of the second median nervule, sometimes still a third tail, but very short, at the termination of the submedian nervure; *anal angle* sometimes rounded, sometimes acute, sometimes distinctly lobed; *abdominal margin* sometimes straight, sometimes convex to the termination of the internal nervure, then slightly emarginate; *costa* sometimes regularly arched, sometimes bowed at base, then quite straight, sometimes the outer margin is anteriorly produced at the apex thus causing the costa to be sinuate; *costal nervure* sometimes nearly straight, sometimes considerably bowed, sometimes lying quite close to the margin, sometimes well removed from it; *first subcostal nervule* arched, given off some little distance before the apex of the cell; *upper disco-cellular* nervule shorter than the lower, slightly concave, slightly outwardly oblique, *lower* disco-cellular sometimes upright, sometimes slightly inwardly oblique, straight or slightly concave; *second median nervule* emitted always a little before the lower end of the cell; *submedian nervure* a little waved; *internal* nervure short, recurved. *Antennæ* short, less than half the length of the costa of the forewing, with a gradually-formed, attenuated club. *Palpi* moderately long, porrect. *Eyes* smooth. *Body* moderately robust.

LARVA onisciform, posteriorly flattened, bristly at the sides. PUPA of the usual lycænid shape. The transformations of three species are known, *A. centaurus*, Fabricius, and *A. amantes*, Hewitson, from Ceylon, and *A. apidanus*, Cramer, from Java.

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* In some species the middle disco cellular appears almost to form the base of the lower discoidal nervule, being nearly as thick as that vein, in other species the middle disco-cellular is but little thicker than the lower, in others again both are equally thin.

The genus *Arhopala* was instituted by Boisduval for the reception of two new species of butterflies, the one from Papua which he named *A. phryxus*, and the other from the Aru Islands which he named *A. meander*. He gave no diagnosis of the genus, except that the insects are rather large, and the only authors who have used it in the sense understood in this work, and, indeed, at all, are Drs. Staudinger and Felder. The former eminent writer quite correctly saw that the genus *Amblypodia* of Horsfield, of which *narada*, Horsfield, is the type, differs so entirely in structure and *facies* from the mass of butterflies generally placed under that name that it could not be correctly used for them. During the last ten years Mr. Moore has tried to split up the genus *Arhopala* by proposing seven new genera. Mr. Distant in his "Rhopalocera Malayana" refers to four of these only, and sinks two of them as synonyms, retaining two only as distinct, but with much doubt. He ignores the two genera *Darasana* and *Mahathala* of Mr. Moore, and the *Arhopala* of Dr. Felder, entirely, though representatives of all of them occur in the Malay peninsula. Having very carefully examined the neuration and outline of the wings of these seven genera of Mr. Moore, I have no hesitation in sinking five of them as synonyms, and I retain two of them with great reluctance, *viz.*, *Mahathala* for a single species which presents two very aberrant features, and *Acesina* with two species, which have rather a peculiar *facies* as regards the markings of the underside. In the above diagnosis of the genus *Arhopala*, I have tried to point out the chief differences that exist in the structure of the insects of this genus. It will be noticed that the venation differs but little, but the outline of the wings, especially of the hindwing, is very variable. I find it impossible, however, to draw any line of demarcation between the species which would enable them to be distinguished as belonging to distinct genera, much as I should like to be able to do so. The genus as it stands is most unwieldy, but it is no gain either to science or to convenience to imagine generic distinctions where none exist. The most obvious structural character is the presence or absence of a tail or tails to the hindwing, but in the same page in which Mr. Moore described the genus *Panchala* he placed under it tailed and tailless species. And so with the other genera, though he gives the presence or absence of the tail as a generic character, he indiscriminately mixes up species with and without tails under the same generic name. Generic characters may still be found by which to divide these butterflies satisfactorily when the eggs, the prehensores of the males, and the legs of both sexes come to be examined, but it appears to me hopeless to look further for such characters in either venation or outline of wings. Mr. Doherty's proposed new genera, *Flos* and *Iois*, cannot properly be discussed here, as no diagnosis of them has been written.

An *Arhopala* is unmistakable, the merest tyro in Oriental butterflies should at once be able to distinguish any species as belonging to the genus, which contains some of the largest as well as most beautiful of oriental *Lycænidæ*. Nearly all the species are of some shade of blue or purple on a black ground on the upperside, the females with the blue or purple colour always more restricted than in the male. A few species of the *eumolphus* group are, however, brilliant shining green on the upperside of the males, but their females are of the ordinary purple type.* Most fortunately the undersides of both sexes are practically marked

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* Since the above was written, Mr. Doherty has lent me the MS. of a paper to be hereafter published, in which the following most interesting note is given :—"A word deserves to be spoken on the subject of green butterflies, since it seems one little understood at home. Early in the century Horsfield professed to have found a green female of the Javan *Arhopala eumolphus*, Cramer, the true female of which is blue. Recently Mr. Distant has described as the female of his *A. farquharii*, a butterfly bright green over the basal half of the wings above. Now the real female of *A. farquharii* (perhaps the form described as "*Narathura*" *maxwellii*, Distant) is violet-blue, and one of the most constant of butterflies. Of the green form mentioned I have taken several specimens in the Malay Peninsula and in Borneo, and they are all males. It is a rare species, undescribed, perhaps identical with the Horsfieldian form."

"Grant Allen shews that while greenish flowers are amongst the oldest, really green flowers are the most recently developed of all, and among the most conspicuous. Very much the same thing is true of *Lepidoptera*. Pale green moths like *Actias*, *Geometra* and *Pyralis* are protected by their colouring which is common to both sexes, and are quite hidden when resting among the leaves. Such seems also to be the case with *Lehera eryx*, Linnæus, a lycænid which is greenish on the *underside*, and may possibly be the case with some *Catopsilias* [a genus of the next subfamily, the *Pierinæ* or "Whites"]. But bright metallic-green is, I think, the latest-developed colour among butterflies, and decidedly the most conspicuous. No one who has not seen it can imagine the brilliancy of *Arhopala farquharii* or *Ornithoptera brookeana*, Wallace, [*Ornithoptera* is a genus or subgenus of the *Papilioninæ*] in the greenest jungle. The brightest of the metallic-blue butterflies look dim beside them. It may be confidently asserted of all such butterflies, that unless the species is protected, only the male is green. The protected *Ornithopteras* have sometimes assumed green colours as well as golden and orange, and the female shares in this useful ornamentation to a slight degree, alike, they are usually of some shade of grey or brown, with numerous darker spots and catenulated bands. Many species have patches of metallic green or blue scales at the anal angle of the hindwing. Secondary sexual characters in the male are entirely absent, unless the differently-shaded round patch of scales on the upperside of the forewing in *A. atosia*, Hewitson, and *A. antimuta*, Felder, can be so considered.

About one hundred species of *Arhopala* have been described up to date, most of which are strictly Oriental, and occur in India, Ceylon, the Andaman Isles, Burma, the Malay peninsula, and throughout the Malay archipelago; some species are found in China and Japan, and one or two have been recorded from Northern Australia. Mr. Distant[*] refers to the great variation which he has found to exist in the markings of the underside of the wings of species of this genus. As far as my experience of the Indian species goes, I have not found this variation of any very great extent, or of such a character as to render the identification of species difficult. The opposite may be the case, however, with the species occurring in the Malay Peninsula. He also remarks that "the shade of blue on the upperside is often so different as to lead to only two conclusions, *viz.*, either that we are dealing with the most closely allied species, or with seasonal forms of one species." With regard to the last remark, I have not noticed that seasonal variation occurs within strict Indian limits, nor have I found that the shade of blue is given to much variation. It is also said to be difficult in some instances to identify the species Mr. Hewitson described, the type specimens not agreeing with his figures and descriptions. As Mr. Hewitson, I believe, never placed a type ticket *on* his type specimens, but only the name of the species under his series of specimens of it, and not improbably may have substituted different and better specimens for those he originally described, if these were not in good condition, it appears to me that when specimens have been obtained which agree better with his plates and descriptions than with the specimens standing under those names in his collection (which may indeed represent totally distinct species), they should be named in accordance with the plates and descriptions, and not in accordance with the specimens against which the names stand in his collection. Even in the case of types which have been properly labelled, the tickets may be changed or lost, so that when a species can be named with certainty from figures and descriptions, the type specimens may be ignored.

I think I am correct in saying that all *Arhopalas* are given to haunting trees and bushes, and, broadly speaking, are forest butterflies. The males, I believe, seldom or never go down to the beds of mountain streams to suck up moisture, nor are they ever found on flowers. They do not fly much either, so almost the only way to catch them is to beat the bushes and lower branches of the trees, and catch them as they fly up or watch where they settle. They have a rather quick flight, but usually fly but for a short distance even when disturbed. Many species seem to be very common where they occur; others again appear to be very rare. Owing to their skulking habits, and to the consequent difficulty in collecting them, many new species doubtless yet remain to be discovered.

I give below as foot-notes[†] the original diagnoses of the several genera proposed by Mr. Moore for species which I include under *Arhopala*.

In non-protected butterflies the green is confined to the upperside, and is quite invisible except during flight. In the *Lycænidæ* it is found in many *Zephyri*, in some *Poritias* and *Massagas*, in a few *Arhopalas* and in *Lampides marakata*, Doherty, a rare butterfly I discovered in the Malay Peninsula, and named after its emerald tint above. Among all these whenever the female is known, it is blue, orange, black, violet, or any other colour but green. The conservative and, in butterflies, unadorned sex, has not yet acquired the latest development in colours. It is also remarkable that the green colours seem to occur where the genus is most dominant. The Malay Peninsula and Borneo form the great centre of development of the genera *Arhopala* and *Lampides*, it is there that most of the green species occur. The outlying *Arhopalas*, those of the North-West Himalayas and the Timorian Islands, are all blue. In *Zephyrus* the green species are found only where the genus is best represented and most vigorous. *Zephyrus pavo*, de Nicéville, a species found in the Bhutan and Assam hill-ranges, remote from the regular habitat of the genus, has, I discovered the male blue and greatly resembling the allied females from the Western Himalayas. The green and orange *Ornithopteras* also occur only in the heart of the *Ornithoptera* region. These remarks on green butterflies also apply in some degree to certain other *unusual* colours of great brilliancy, such as the shining coppery-gold of *Ilerda brahma*, Moore, and the fiery red of *Thamala marciana*, Hewitson. It ought to be borne in mind that such colours ought never to be ascribed to a female without careful examination."

[*] Rhopalocera Malayana, p. 463 (1886).

[†] Genus NARATHURA, Moore. *Narathura*, Moore, Proc. Zool. Soc. Lond., 1878, p. 835. "WINGS, broad. FOREWING, very convex at base of costa, exterior margin rounded, even. HINDWING, very convex externally, with even margin; a very slender tail at end of first median nervule (so delicate that in most cabinet specimens it is broken off): anal angle not lobed. Type, *N. hypomuta* (*Amblypodia hypomuta*, Hewitson, Cat. *Lycænidæ* B. M., p. 11, n. 52, pl. vi, figs. 63, 64, *male* (1862)." (*Moore*, l. c.)

Key to the Indian species of Arhopala.

A. Hindwing with tail at apex of first median nervule.

a. Tail long (except in No. 812, *A. artegal*, Doherty, in which it is short and tooth-like).

a^1. Male, upperside, both wings of some shade of blue or purple.

a^2. Male, upperside, both wings, of a blue or purple colour often shining but never metallic.

a^3. Male, upperside, both wings dark blue or purple.

a^4. Both sexes, underside, forewing with annular spots in cell.

a^5. Both sexes, expanse two inches and over.

a^6. Both sexes, hindwing with no anal lobe.

786. A. CENTAURUS, Eastern Himalayas, Assam, Burma, Malay Peninsula, Siam, South India, Ceylon, Andaman Isles, Sumatra, Nias Island, Java, Borneo.

b^6. Both sexes, hindwing with an anal lobe.

a^7. Male, upperside, both wings with no outer black margin, cilia only black.

787. A. AGNIS, Burma, Malay peninsula, Sumatra.

b^7. Male, upperside, both wings with outer black margin.

a^8. Both sexes, underside, forewing with a costal spot just beyond the middle.

a^9. Male, upperside, both wings margined narrowly with black.

a^{10}. Male, forewing, outer margin straight; hindwing posteriorly elongated. Forewing, underside, second spot from costa of discal band larger than the spot on either side of it.

788. A. SILHETENSIS, Jalpaiguri, Sylhet.

b^{10}. Male, forewing, outer margin convex; hindwing rounded, not posteriorly produced. Forewing, underside, second spot from costa of discal band of the same size as the spot on either side of it.

789. A. ADOREA, Sikkim, Assam, Burma, Malay peninsula.

Genus NILASERA, Moore. *Nilasera*, Moore, Lep. Cey., vol. i, p. 114 (1881). "WINGS, ample. FOREWING, subtriangular, *costa* much arched from the base, *apex* acute, *exterior margin* very slightly oblique and convex at lower angle, *posterior* margin recurved; *costal nervure* short, extending only to one-third the margin; *subcostal nervules* at equal distances apart, *first* subcostal at three-fifths before the end of the cell, *fourth* subcostal at two-thirds from the third and terminating at the apex, *fifth* subcostal from the end of the cell; upper [*middle*] *disco-cellular* nervule shortest, oblique, *lower* disco-cellular erect; radial [*lower discoidal*] nervule from their angle, *discoidal cell* long, more than half length of wing; *second median* nervule at one-fifth, and *first* median at two-fifths before the end of the cell, *submedian nervure* straight. HINDWING, broadly oval; *costa* very convex; a short thickish *tail* from first median nervule; *anal angle* somewhat pointed and not lobed; *costal nervure* abruptly arched from base; *first subcostal nervule* at nearly one-half before the end of the cell; *upper disco-cellular* nervule shortest, outwardly oblique, *lower* disco-cellular recurved, *discoidal* nervule from their angle; *second median* nervule at one-sixth, and *first* median at one-third before the end of the cell; *submedian nervure* nearly straight; *internal* nervure recurved. BODY robust; *thorax* stout; *palpi* porrect, second joint very flat, attenuated towards the apex, squamose, projecting half beyond the head, third joint slender in the female, one-third length of second; *legs* squamose; *antennæ* gradually thickened towards the end, tip more slender. Type, *N. centaurus*, Fabricius." (*Moore*, l. c.)

Genus PANCHALA, Moore. *Panchala*, Moore, Proc. Zool. Soc. Lond., 1882, p. 251. "WINGS, small, short, broad. FOREWING, much arched; *exterior margin* erect, slightly convex hindwards; *discoidal cell* extending beyond half the wing; *costal nervure* extending to nearly half the margin; *first subcostal nervule* emitted at two-fifths and *second* subcostal at one-fifth before the end of the cell, *third* subcostal bifid at one-third before the apex, *fifth* subcostal from slight angle at end of the cell; *disco-cellular* nervule slightly bent near upper end; *discoidal* nervule from the angle; *second median* nervule near end of the cell, *first* median at one-fourth before the end, curved downwards; *submedian nervure* straight. HINDWING, very convex externally; *costa* much recurved from the base, *apex* angular; *costal nervure* recurved, extending to the apex; *first subcostal nervule* emitted at one-third before the end of the cell; *disco-cellular* nervule slightly bent in the middle, *discoidal* nervule from the angle; *second* and *third median* nervules from the end of the cell, *first* median at one-fourth before the end; *submedian nervure* straight, *internal* nervure recurved. BODY, short, *thorax* moderate; *palpi* porrect, compactly squamose, second joint projecting half its length beyond the head, third joint one-third its length, slender; *legs* compactly squamose; *antennæ* short, thickening to the apex. Type, *P. ganesa*, Moore." (*Moore*, l. c.) Mr. Moore describes only one disco-cellular nervule in both wings, of course there are two.

Genus SATADRA, Moore. *Satadra*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 38 (1884). "FOREWING, comparatively longer and narrower than in typical *Panchala*, Moore, the *costa* abruptly arched at the base, *exterior margin* oblique. HINDWING, slightly but regularly arched along the *costa*, *apex* very convex, *exterior margin* oblique, with a slender *tail* at the end of the first median nervule, and a point at the ends of the second median nervule and submedian nervure. *Venation* similar to that of *Panchala*. Type, *S. atrax*, Hewitson." (*Moore*, l. c.) Mr. Moore should have mentioned the distinct lobe at the anal angle of the hindwing present in the type species.

Genus DARASANA, Moore. *Darasana*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 42 (1884). "FOREWING, short, broad, triangular; *apex* acute, *exterior margin* very slightly oblique, *posterior angle* somewhat rounded. HINDWING, short, broad; *costa* arched towards the base, *exterior margin* very convex; no *tail* [or *anal lobe*]. *Antennæ* slender. Type, *D. perimuta*, Moore." (*Moore*, l. c.)

b^{9}. Male, upperside, both wings margined broadly with black.

790. A. VENDAVA, Burma.

b^{5}. Both sexes, underside, forewing with no costal spot just beyond the middle

a^{6}. Both sexes, underside, hindwing with discal band continuous.

791 A. AMANTES, India, Ceylon, Burma, South Andaman Isles, Makassar.

b^{6}. Both sexes, underside, hindwing with discal band anteriorly broken up into spots in pairs.

792. A VIHARA, Burma, Malacca, Nias Island.

b^{4}. Both sexes, expanse two inches and under.

a^{5}. Male, upperside, forewing with a round discal patch of scales of a different shade in some lights to the scales on the rest of the wing, no outer black margin, cilia only black

793 A ATOSIA, Burma, Malay peninsula, Sumatra, Borneo

b^{5}. Male, upperside, forewing with no differently coloured discal patch, with outer black margin, often very narrow.

a^{7}. Both sexes, underside, hindwing, costa at middle with a prominent whitish spot

a^{8}. Both sexes, hindwing, costa straight, apex acute, with three tails.

794 A ABSEUS, Sikkim, Assam, Burma, Malay peninsula, Borneo.

b^{8}. Both sexe, hindwing, costa slightly emarginate, apex rounded, with one tail.

795. A AMMON, Burma, Malay peninsula.

b^{7}. Both sexes, underside, hindwing, costa at middle with no prominent whitish spot.

a^{8}. Both sexes, underside, both wings without silky gloss, tail slender, filiform, not wedge shaped.

a^{9}. Both sexes, underside, forewing with discal band continuous, unbroken.

a^{10}. Both sexes, underside, both wings reddish brown, markings small and indistinct.

796 A ŒNEA, Sikkim, Assam

b^{10}. Both sexes, underside, both wings brown, more or less washed with purple, markings prominent

a^{11}. Both sexes, underside, forewing with discal band broad.

a^{12}. Male, upperside, both wings deep purple, outer black margins narrow.

797 A. AGABA, Burma.

b^{12}. Male, upperside, both wings lighter, more bluish-purple than in *A. agaba*, outer black margins fully three times as broad; underside, forewing with discal band broader, more regular and more continuous.

798. A. SELTA, Burma.

b^{11}. Both sexes, underside, forewing, with discal band narrow.

a^{12}. Male, upperside, *both wings with* outer black border narrow, coloration shining bluish-purple.

799. A. CANARAICA, South India.

800. A. ALEA, India.

b^{12}. Male, upperside, both wings with outer black border twice as broad as in *A. canaraica* and *A. alea*, coloration duller purple.

801. A. ATRAX, India.

b^{9}. Both sexes, underside, forewing with discal band discontinuous, broken.

a^{10}. Male, underside, both wings not powdered with grey; upperside, both wings bluish-purple.

a^{11}. Both sexes, underside, both wings glossed with purple.

802. A. AIDA, Burma.

b^{11}. Both sexes, underside, both wings not glossed with purple.

803. A. RAFFLESII, Burma, Malay peninsula.

b^{10}. Both sexes, underside, both wings powdered with grey.

a^{11}. Male, upperside, forewing, outer black border broad.

a^{12}. Both sexes, underside, forewing with markings of the ground-colour of the wing, prominently outlined with white, broad.

804. A. BAZALUS, Nepal, Assam, Java.

b^{12}. Male, underside, forewing with markings much deeper coloured than the ground, obscurely outlined with greyish, narrow.

805 A. SINGLA, Sikkim.

b^{11}. Male, upperside, both wings very deep purple, almost black; outer black borders much narrower than in *A. bazalus* and *A. singla*.

806. A. TEESTA, Sikkim, Sylhet, Burma.

b^{8}. Both sexes, underside, both wings with a silky gloss. tail rather short, thick, wedge-shaped.

807. A. RAMA, Himalayas, Burma, China.

b^{4}. Both sexes, underside, forewing with no annular spots in cell, but with a prominent pale usually quadrate spot near the end of the cell.

a^{5}. Both sexes, underside, hindwing with the usual macular discal band.

a^{6}. Both sexes, underside, hindwing with prominent black spots on anal region heavily overlaid with metallic green scales.

808. A. ASOKA, Sikkim.

b^6. Both sexes, underside, hindwing with no prominent black spots on anal region heavily overlaid with metallic green scales, if present at all, obsolescent.

809. A. ADRIANA, Sikkim.

b^5. Both sexes, underside, hindwing with the usual macular discal band replaced by a lengthened dark fascia.

a^6. Both sexes, underside, hindwing with the broad subbasal fascia entire.

a^7. Both sexes, underside, hindwing with the apex pale purple.

810. A. APIDANUS, Burma, Malay peninsula, Sumatra, Java, Borneo.

b^7. Both sexes, underside, hindwing with the apex marked with a prominent dark patch.

a^8. Male, upperside, both wings with marginal border reduced to a more thread.

811. A. FULGIDA, Sikkim, Khasi Hills, ? Philippines.

b^8. Male, upperside, both wings with marginal black border very broad, occupying more than half the surface, tail very short.

812. A. ARTEGAL, Burma.

b^6. Both sexes, underside, hindwing with the broad subbasal fascia broken up into spots.

813. A. DIARDI, Assam, Malay peninsula, Siam.

b^3. Male, upperside, both wings light blue.

a^4 Of very large size, over two inches in expanse; both sexes, underside, both wings with small, well-separated, distinct black white-bordered markings.

814 A. CAMDEO, Sikkim, Assam, Chittagong Hill Tracts.

b^4. Of smaller size, under two inches in expanse; underside, forewing, discal band formed of confluent fuscous spots, not outwardly defined with white.

a^5. Underside, both wings without silky gloss; tail slender, filiform.

a^6. Male, upperside, both wings pale purplish-lilac blue, with anteciliary black thread only.

815. A. OPALINA, Assam.

b^6. Female, upperside, both wings rich cerulean-blue, with broad black outer borders.

816. A. WIMBERLEYI, South Andaman Isles.

b^5. Underside, both wings with a silky gloss; tail rather short, thick, wedge shaped.

817. A. DODONÆA, Western Himalayas.

b^2. Male, upperside, both wings brilliant metallic blue.

a^3. Of large size, over two inches in expanse.

a^4. Male, upperside, both wings, blue colour deep and rich, of uniform tint throughout.

818. A. ANTHELUS, Burma, Malay peninsula.

b^4. Male, upperside, both wings, disc silvery blue, gradually merging into the deeper purple costal and outer margins

819 A. ANARTE, Burma, Malay peninsula, Borneo.

b^3 Of smaller size, under two inches in expanse.

a^4. Underside, hindwing with a prominent broad white fascia below the costa at right angles to the body.

820. A. SUBFASCIATA, Burma.

b^4. Underside, hindwing with no prominent broad white fascia below the costa at right angles to the body, ground uniformly coloured throughout.

821. A. ALBOPUNCTATA, Burma.

Male, upperside, both wings brilliant metallic green.

a^3. Both sexes, underside, both wings with a silky gloss.

822. A. EUMOLPHUS, Eastern Himalayas, Assam, Chittagong Hill Tracts, Java.

b^3. Both sexes, underside, both wings, without silky gloss.

a^4. Male, upperside, both wings with the outer black margins broad; underside, both wings not irrorated with white.

823. A. FARQUHARI, Burma, Malay peninsula, S.-E. Borneo

b^4. Male, upperside, both wings with the outer black margins narrow, underside, both wings irrorated with white

824 A, HELLENORE, Burma.

- *b*. Tail very short, tooth like. Male, upperside, both wings rich ultramarine-blue as in *A. areste*, outer black margins very narrow
  - 825. A. MOELLERI, Sikkim, Assam.
- **B.** Hindwing with no tail at apex of *first median nervule*
  - *a*. Underside, hindwing with no green or blue metallic scales on margin at anal angle.
    - a^1. Underside, both wings brown throughout, except inner margin of forewing which is paler.
      - a^2. *Upperside*, both wings shining deep morpho blue, underside, both wings with all markings obscure and ill-defined, no annular markings whatever
        - 826 A. ANDAMANICA, Andaman Isles
      - b^2. Upperside, both wings purple, underside, both wings with all markings prominent, annular and well defined
        - a^3 Of small size, 1 4 inches and under in expanse underside, forewing, disco-cellular spot not joined to broad transverse band below median nervure
          - a^4. *Upperside, hindwing, purple area not extending beyond middle of wing*; underside, both wings with markings very small
            - 827 A PARAMUTA, Nepal Sikkim
          - b^4. Upperside, hindwing cobalt blue or violet blue area extending to basal two-thirds, underside both wings with markings larger and more distinct.
            - a^5 Upperside, both wings brilliant cobalt blue
              - 828 A ZETA, Andaman Isles
            - b^5 Upperside, both wings violet blue.
              - 829 A ROONA, Andaman Isles
        - b^3 Of larger size, 1 5 inches and over in expanse, underside forewing, disco-cellular *spot joined to broad transverse band below median nervure*
          - 830 A TOUNGUVA, Andaman Isles, Burma
    - b^1 Underside both wings rufous throughout, except inner margin of forewing, which is paler
      - 831 A ASOPIA, Burma
    - c^1. Underside both wings brown glossed with purple
      - a^2 Underside, forewing, discal band broad, continuous not divided into well-separated spots
        - a^3 Of small size, 1 5 inches and under underside, hindwing with a broad pale ochreous discal transverse band
          - 832 A PERIMUTA Sikkim, Assam, Burma
        - b^3 Of *larger size*, 1 5 *inches and over*, *underside*, hindwing with no broad pale discal transverse band
          - a^4 Hindwing, outer margin even, entire, upperside, hindwing with a very *small patch of blue towards base of wing*
            - 833 A. DUESSA, Burma.
          - b^4. Hindwing, outer margin toothed at the end of each vein, upperside, both wings, outer margin narrowly black, rest of surface rich ultramarine blue.
            - 834 A ARESTE, Nepal, Sikkim.
      - b^2 Underside, forewing, discal band formed of five round well separated annular spots.
        - 835 A BELPHOEBE, Burma
    - d^1 Underside, both wings cream white, hindwing, costa sinuous, apex produced.
      - 836 A GANESA, Western Himalayas
  - *b*. Underside hindwing with green or blue metallic scales on margin at anal angle
    - a^1. Male, upperside, both wings light blue, black borders very broad
      - 837 A BIRMANA, Burma
    - b^1 Male, upperside, both wings morpho blue, outer black border narrow, wide in female
      - a^2 *Underside forewing*, second spot *from* costa *of* discal band no larger than spot on either side of it
        - 838 A MOOLAIANA, Burma
      - b^2. Underside, forewing, second spot from costa of discal band much larger than spot on either side of it.
        - 839 A PASTORELLA, Burma.
    - c^1 Male, upperside, forewing violet blue, hindwing morpho-blue, outer black borders rather broad.
      - 840. A. METAMUTA, Burma, Malacca, Sumatra.
    - d^1. Male upperside, both wings ultramarine blue, outer black border narrow, thread like.
      - 841 A HYPOMUTA, India, Penang, Malacca, Borneo
    - e^1. Male, upperside, both wings violet-blue, outer black borders broad.
      - 842 A. PERISSA, Burma.

*f*¹ Male, upperside, both wings dark blue, outer black borders narrow.

*a*² Underside, forewing with bands and spots of the ground colour, outwardly defined with greyish.

843 A. AGELASTUS, Burma.

*b*² Underside, forewing with bands and spots whitish.

844 A. CHINENSIS, ? Sikkim, South China.

*g*¹. Male, upperside, both wings deep purple, outer black borders narrow, thread like.

845. A. DAVISONII, Burma, Malay peninsula, Borneo.

786 **Arhopala centaurus,** Fabricius

Papilio centaurus, Fabricius, Syst. Ent., p. 520, n. 329 (1775); idem, id., Sp. Ins., vol. ii, p. 117, n. 523 (1781); idem, id., Mant. Ins., vol. ii, p. 68, n. 646 (1787). *Hesperia centaurus*, id., Ent. Syst., vol. iii, pt. 1, p. 275, n. 63 (1793); *Polyommatus centaurus*, Godart, Enc. Méth., vol. ix, p. 658, n. 138 (1823); *Amblypodia centaurus*, Horsfield, Cat. Lep. E. I. C., p. 102, n. 33 (1829); id., Hewitson, Cat. *Lycænidæ* B. M., p. 3, n. 15, pl. ii, figs. 10, 13 *male* (? figs. 12, *male*, 11, *female*) (1862); id., Moore, Proc. Zool. Soc. Lond., 1865, p. 775; id., Butler, Cat. Fab. Lep. B. M., p. 179, n. 1 (1869); id., Druce, Proc. Zool. Soc. Lond., 1874, p. 107, n. 1; id., Butler, Trans. Linn. Soc. Lond., Zoology, second series, vol. i, p. 548, n. 1 (1877); *Narathura centaurus*, Distant, Rhop. Malay., p. 261, n. 1, pl. xxi, figs. 4, *male*, 5, *female* (1885). *Nilasera centaurus*, Moore, Journ. Linn. Soc. Lond., Zoology, vol. xxi, p. 44 (1884). *Amblypodia pseudocentaurus*, Doubleday, List Lep. B. M., vol. ii, p. 24 (1847); *Arhopala centaurus*, var. *coruscans*, Wood-Mason and de Nicéville, Journ. A. S. B., vol. xlix, pt. 2, p. 234, n. 54 (1880); *Polyommatus helus*, Godart, Enc. Méth., vol. ix, p. 652, n. 113 (1823); *Amblypodia nakula*, Felder, Wien. Ent. Monatsch., vol. iv, p. 395, n. 4 (1860); id., Druce, Proc. Zool. Soc. Lond., 1873, p. 353, n. 1; id., Kheil, Rhop. Nias, p. 33, n. 121 (1884). *Arhopala nakula*, Felder, Reise Novara, Lep., vol. ii, p. 222, n. 224, pl. xxix, fig. 14 (1865); id., Moore, Proc. Zool. Soc. Lond., 1877, p. 590; idem, id., l. c., 1878, p. 835; id., Wood-Mason and de Nicéville, Journ. A. S. B., vol. l, pt. 2, p. 251, n. 77 (1881); *Nilasera pirama*, Moore, Lep. Cey., vol. i, p. 116, pl. xliii, figs. 3, 3*a*, *male*; 3*b*, *female*; 3*c*, *larva* and *pupa* (1881); *Nilasera pirithous*, id., Proc. Zool. Soc. Lond., 1884, p. 531.

HABITAT. Eastern Himalayas, Assam, Burma, Malay Peninsula, Siam, South India, Ceylon, Andaman Isles, Nias Island, Sumatra, Java, Borneo.

EXPANSE. ♂, ♀, 1·8 to 2·4 inches.

DESCRIPTION. Typical race *centaurus*, Fabricius. "MALE. UPPERSIDE, *both wings* dark violaceous blue, [with narrow outer black margins]. *Cilia* brownish. UNDERSIDE, *both wings* ochraceous brown. *Forewing* with two looped spots, margined with pale bluish in the cell, and a subquadrate spot, inwardly margined with pale bluish and outwardly with greyish, at the end of the cell, a waved fascia margined with greyish crossing the wing beyond the cell, and the following spots margined with greyish — one near the costa above the end of the cell, and two beneath the cell divided by the first median nervule; the apical third of the wing is somewhat paler, and contains a marginal and submarginal dark fascia. *Hindwing* with the following spots and fasciæ margined with greyish — seven basal spots, a medial transverse fascia, which is connected above at the second subcostal nervule with a broken macular fascia extending to the abdominal margin; a marginal and two submarginal somewhat obscure fasciæ; three transverse marginal metallic greenish spots near the anal angle. *Body* and *legs* more or less concolorous with the wings. FEMALE. UPPERSIDE, *both wings* violaceous-blue. *Forewing* with the costal and outer margins broadly fuscous. *Hindwing* with the costal margin broadly, and the outer margin narrowly, fuscous. UNDERSIDE, *both wings* as in the male."

"This is the true *Papilio centaurus*, Fabricius, of which I have satisfied myself by a comparison with the Fabrician type contained in the Banksian collection in the British Museum. Considerable confusion exists as to the true identity of this species, and this has been greatly due and is still frequently caused by the erroneous representations of the species given by the late Mr. Hewitson, which seem to apply to a variety or distinct species found in Continental India. It is probably these figures which have induced many to consider as distinct the Malay butterfly described by Felder under the name of *Amblypodia nakula*. Mr. Kirby, in his Catalogue, placed the two species as synonymous with one another; and to render the matter as complicated as possible, N. M. Kheil has recently pointed out that Mr. Kirby is wrong, and uses Felder's name as distinct from the Fabrician. Mr. Butler, in 1869, corrected this error, but his remarks appear to have been overlooked."

"This is an abundant lycænid in the Malay Peninsula, and its distribution extends through Tenasserim into Burma, but, owing to the confusion as to identity, its *known* geographical area is somewhat difficult to ascertain." (*Distant*, l. c.)

The solitary character by which I can distinguish the true *A. centaurus*, Fabricius, from the north-east Indian local race, *A. pirithous*, Moore, is that the male on the upperside has an extremely narrow outer black margin, which is almost confined to the cilia, while in *A. pirithous* this black border is a good deal wider, though still narrow. True *A. centaurus* occurs throughout Burma, and thence southwards to Singapore, in Nias Island, Sumatra, and Borneo. I append a description of this form, which was described by Felder as a distinct species under the name *A. nakula*.*

Local race *pirithous*, Moore. DESCRIPTION: "Allied to *N.* [= *A.*] *nakula*, Felder, [= true *A. centaurus*, Fabricius]. MALE. UPPERSIDE, *both wings* differ in being of a pale purplish-blue, also with a black narrow marginal band. UNDERSIDE, *both wings* darker. *Forewing* with the markings less distinct, the inter-discal space bordering the lunular bands dusky purplish iron grey. *Hindwing* with similarly disposed markings, which are all dusky purplish iron grey, more strongly defined in the male than in the female. FEMALE. UPPERSIDE, *both wings* of a brighter purple-blue than in *N. nakula*." UNDERSIDE, *both wings* as in the male.

"*N. centaurus*, Fabricius, and *N. pseudocentaurus*, Doubleday, are both distinct from the above." (*Moore*, l. c.)

Placing side by side fresh male specimens of true *A. centaurus* from Singapore and fresh specimens of *A. pirithous* from Sikkim and Assam, I can detect no difference in the shade of purple, the solitary character which separates the local race *pirithous* from true *centaurus* being, as stated above, the rather broader outer black margin to both wings on the upperside of the male. The undersides are equally variable in both forms, and there are no distinguishing features whatever between their respective females. This local race occurs commonly at low elevations in Sikkim and throughout Assam.

Local race *pirama*, Moore. DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant ultramarine blue, with a marginal black band. UNDERSIDE, *both wings* brown, suffused with purple-grey. *Forewing* with slender white bordered discoidal marks, less defined discal band, streaks below the cell, and submarginal fasciæ. *Hindwing* with very indistinct browner basal spots, discal band, and submarginal lunular line; a few green speckles above the anal angle. FEMALE. UPPERSIDE, *both wings* purplish-blue, merging to greyish-blue at the base ; marginal bands broad. UNDERSIDE, *both wings* as in the male"

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* *Amblypodia nakula*, Felder, Wien. Ent. Monatsch., vol. iv, p. 395, n. 4 (1860); *Arhopala nakula*, id., Reise Novara, Lep., vol. ii, p. 222, n. 244, pl. xxix, fig. 14 (1865). HABITAT: Malacca interior, Sumatra. EXPANSE: 2·3 inches. DESCRIPTION: "Wings shortly tailed. UPPERSIDE, *both wings* deep violet cyaneous. UNDERSIDE, *both wings* deep brown. *Forewing* with three fuscous cellular spots circled with bluish, and a pair of exterior fuscous fasciæ circled with whitish. *Hindwing* with differently shaped basal spots, an irregular discal fascia and a posterior undate striga fuscous circled with paler, three anal black lunules most densely sprinkled with cyaneous green. FEMALE. UPPERSIDE, *both wings* deep violet cyaneous. *Forewing* with the costa, the apical and external borders, *hindwing* with the costa broadly and the anal margin fuscous."

"Allied to *A. centaurus*, Fabricius."

"English authors from the celebrated Horsfield to Moore (whom he had the good fortune to have as his successor) combine under this one name [*Amblypodia*] very different species, but we consider Boisduval's name *Arhopala* more suitable for these insects, so remarkable for their antennæ being so slightly clavate; as however this name has not yet been published with a description, we retain for the present Horsfield's name." (*Felder*, l. c. in Wien. Ent. Monatsch.)

"MALE. UPPERSIDE, *both wings* violet blue, very narrowly blackish fuscous on the costa and the exterior margin. *Hindwing* with the costal and interior margins fuscous. UNDERSIDE, *both wings* reddish fuscous. *Forewing* pale over nearly the interior half, a pair of rings in the cell and a spot closing the cell of a deeper tint and partly encircled with metallic whitish green, and the following fuscous markings obsoletely margined with whitish: two interior spots interiorly diffuse and a very narrow exterior fascia which is chain-like and broken posteriorly. *Hindwing* with the following olive fuscous markings bordered with a deeper fuscous, and then obsoletely with glaucous and whitish: five basal spots, an irregular small fascia posteriorly interrupted and joined to a wavy discal fascia, also a deeper fuscous wavy and dentated exterior striga bordered on all sides with paler atoms, and another submarginal striga formed of lunules and three anal lunules distinct from these black, and powdered with metallic green. FEMALE. UPPERSIDE, *both wings* of a paler tint than in the male, with the costa and exterior border, fuscous (the latter very narrow in the hindwing). UNDERSIDE, *both wings*, as in the male.

"A local form of the *A. centaurus*, Fabricius, of Continental India, it differs very constantly from this, as also from the Javan *A. pseudocentaurus*, Doubleday, in the colouring of the macular band of the underside of the hindwing. It recedes also from the former in the blunter apex and in the moderately straight exterior margin of the forewing." (*Felder*, l. c. in Reise Novara.)

The prominence and shade of colour of all the markings on the underside in all forms of *A. centaurus* being extremely variable, no species or local race can be based on these characters alone.

"Is nearest allied to the Javan *N* [= *A.*] *pseudocentaurus*, Doubleday, and is quite distinct from both the Indian *N. centaurus*, Fabricius [at this date Mr. Moore had not realized that the true *centaurus* and *nakula* are one species, nor discriminated his N.-E. Indian species *A. pirithous*], and the Malayan *N. nakula*, Felder."

"LARVA elongated oval, depressed, anterior segment scutate ; finely pilose along the sides ; colour green, with dorsal and lateral reddish marks, and an intervening subdorsal slender black line. Feeds on *Schleichera trijuga*. PUPA green ; dorsal segments reddish." (*Moore*, l. c.)

This local race is confined to South India and Ceylon It is a very much better species than *A. pirithous*, Moore, as both sexes can be discriminated by their brilliant blue (not dull purple) colour on the upperside. In Ceylon it occurs at "Kandy and Galle. Common ; but settles rather high" (*Wade*). "Colombo, and low country" (*Mackwood*). It occurs also in the Nilgiris, North Canara, and Travancore.

Local race *coruscans*, Wood-Mason and de Nicéville. DESCRIPTION. "MALE and FEMALE. UPPERSIDE, *both wings* with the base, but especially in the female, lighter, with a greenish tinge, so that the whole medial portion appears brilliantly illuminated by a pale greenish blue reflection in most lights" (*Wood-Mason* and *de Nicéville*, l c.)

This local race is confined to the South Andaman Isles, where it appears to be fairly common. The male may be known from *A. pirama* on the upperside by its more brilliant and lighter blue coloration, and in the female the brilliant basal blue portion is lighter and also better defined from the darker deep blue portion beyond.

There is yet another local form, the *A pseudocentaurus* of Doubleday, described fully by Dr. Horsfield under the name of *centaurus*, Fabricius. As it occurs in Java only, I do not give a description of it. It appears to come near to the local races *pirama* and *coruscans*.

To sum up. *A. centaurus* is one of the commonest species of the genus where it occurs (at low elevations in Sikkim it may be disturbed in great numbers by shaking the lower branches of Sal trees), and is also one of the widest-spread. On the underside it is apparently variable wherever it occurs, the ground-colour in some examples is very pale, the dark markings standing out conspicuously, in others the ground-colour is dark, and the markings are consequently obscure. The presence of the irrorated green scales at the anal angle is very variable : in some specimens there is a large patch of these scales, in other examples such scales are entirely wanting The species has developed several local races, which are of different value, *pseudocentaurus*, *coruscans*, and *pirama* forming one group, the true *centaurus* and *pirithous* another.

787. **Arhopala agnis**, Felder.

A agnis, Felder, Reise Novara, Lep, vol ii, p 228, n. 952 (1865) ; id, Staudinger, Ex. Schmett., p. 281, pl xcvi, *male* (1888), ***Amblypodia agnis***, Hewitson, Ill. Diurn Lep, p 14a, n 74 (1869), ***Narathura agnis***, Distant, Rhop. Malay, p. 262, n 2, pl xxi, fig 29, *female* (1885), ***Amblypodia anarte***, Hewitson, Ill. Diurn Lep, p 4, n. 8, pl. 1, figs. 6, 7, *female* (1863)

HABITAT : Malacca interior (*Felder*), Sumatra (*Hewitson*), Malacca, Perak (*Distant*), Mergui, Upper Tenasserim (*Doherty*).

EXPANSE : ♂, 2·00 to 2·40 ; ♀, 2·35 to 2·45 inches.

DESCRIPTION : "MALE. UPPERSIDE, *both wings* brilliant violet-blue, very narrowly blackish-fuscous along the margins. *Hindwing* darkening with blackish along the interior margin, *tail* with a white tip UNDERSIDE, *both wings* pale brownish, with a double series of whitish, narrow, exterior lunules. *Forewing* pale on the interior third of the surface, and with the following markings of a little deeper tint than the ground-colour, and margined with whitish :— two annular marks in the cell, a spot at the end of the cell, another above the origin of the first median nervule, and a narrow, exterior, chain-like fascia, formed of six spots, and twice broken. *Hindwing* with the following markings of a little deeper tint than the ground-colour, margined with whitish-brown, and all well-separated one from the other :—six annular spots, three basal, two subbasal, and one internal, a small disco-cellular fascia, a spot below it, and an exterior fascia, which is chain-like anteriorly, interrupted at the second subcostal nervule, and posteriorly broken and bent upwards ; there are also three black anal spots, the first and third bordered inwardly with metallic blue, the middle one overlaid with atoms of this colour." (*Felder*, l. c.) "FEMALE. UPPERSIDE, *both wings* violaceous-blue, costal and outer margins broadly fuscous. [*Hindwing* with the abdominal margin broadly whitish.] UNDERSIDE, *both wings* pale brownish, with the following spots and fasciæ margined with greyish :—*forewing* with two spots in the cell and one at the end of the cell, two spots beneath the cell divided by the first median nervule, a somewhat curved macular fascia between the end of the cell and the outer margin commencing near the costa and terminating at the first median nervule, and a more obscure submarginal fascia. *Hindwing* with about seven basal spots, a subquadrate spot at the end of the cell continued as a macular fascia to the abdominal margin, an outer discal macular fascia which becomes duplex near the anal angle, and a somewhat obscure submarginal fascia ; three transverse, marginal, metallic greenish streaks, the innermost with a black spot near the anal angle (*two of these are rubbed or obliterated in the specimen figured*) ; *tail* with the apex greyish-white. *Body* above more or less concolorous with the wings, beneath more or less greyish ; *legs* pale brownish." (*Distant*, l. c.)

"Our single male is most closely allied to the insect which Hewitson (Ill. Diurn. Lep., p. 4, n. 8, pl. 1, figs. 6, 7, *female*) figures as the female of his *A. anarte*, but it is safe to separate it owing to the smaller spots of the underside, and the two uppermost ocelli on that side fully separated from the fascia of the hindwing."

"Of the true *A. anarte*, Hewitson, we received also a male from Count Castelnau from the interior of Malacca." (*Felder*, l. c.)

"It is evidently a much rarer insect than *N.* [= *A.*] *centaurus*, Fabricius, or at least more seldom met with by collectors. Mr. Kirby has placed *N. agnis* as a synonym of the Sumatran species, *N. anarte*, Hewitson, but it is sufficiently distinct for specific separation." (*Distant*, l. c.) With reference to this remark, the true *A. anarte* of Hewitson, described without locality, is of course distinct, but the female example Mr. Hewitson figured under that name is undoubtedly the female of *A. agnis*, as pointed out by Hewitson himself, and it occurs in Sumatra, according to that writer.

Neither Felder nor Distant describe all the spots which are found on the underside of this species. In the six specimens I have seen, three males and three females, two have a small spot above and attached to the spot in the middle of the cell of the forewing on the underside, two specimens have a small spot above the subcostal nervure between the spot in the middle of the cell and the spot closing the cell, and two specimens possess a small spot on the costa above the spot closing the cell ; the discal series consists of seven spots, the uppermost at the costa out of line, shifted towards the base of the wing. In the hindwing there are four subbasal spots in a curved series, then three larger spots beyond in a straight line, a large spot closing the cell, and a small one below it at the base of the first median interspace ; the discal series is particularly regular, it consists of six annular spots arranged in pairs, then a lengthened hook-shaped spot reaching the abdominal margin.

In the Indian Museum, Calcutta, are a pair of this species from Perak, and I possess a single female taken in the Thoungyeen Forests, Upper Tenasserim, in March, by Major C. T. Bingham. The coloration of this specimen is much more blue on the upperside than the Perak female, but it does not otherwise differ. Mr. Doherty took it at Mergui.

788. **Arhopala silhetensis**, Hewitson.

Amblypodia silhetensis, Hewitson, Cat. *Lycænidæ* B. M., p. 7, n. 31, pl. iv, figs. 27, 28, *male* (1862).

HABITAT: Sylhet (*Hewitson*) ; Sikkim Dooars.

EXPANSE: ♂, ♀, 2·1 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* bluish-purple. *Forewing* with the outer margin narrowly black. *Hindwing* with the costa and apex widely, and the outer margin less widely, black, the abdominal margin pale. UNDERSIDE, *both wings* dull brown, the markings darker brown with pale edges. *Forewing* with the inner margin broadly paler; a rather small round spot near the base of the cell, a larger oval spot across its middle, a still larger somewhat quadrate spot closing the cell, with a small round spot on the costa above it; a discal catenulated band of seven spots arranged in echelon, the first group consisting of four spots trending obliquely outwards, the second spot from the costa of these four larger than the spot on either side of it, the fourth spot larger than the third but not as large as the second; the next group of two spots divided by the second median nervule shifted inwards; the last group consisting of a single spot in the submedian interspace also shifted inwards; a rather prominent submarginal and obscure marginal fasciæ. *Hindwing* with a double series of subbasal spots, the inner series of four, the outer of three spots, the usual bifurcating irregular catenulated band across the disc, submarginal and marginal very obscure fasciæ, the inner portion of the submarginal fascia sprinkled with dull metallic green scales, the anal lobe large, bearing a prominent large deep black spot, with some dull metallic green scales on the margin beyond, an elongated black spot on the margin in the first median interspace slightly sprinkled with green scales, *tail* black above, brown below, tipped with white. FEMALE. UPPERSIDE, *both wings* of a brighter and lighter blue colour than in the male. *Forewing* with the costa and outer margin broadly, the apex very broadly black, the blue colour occupying about two-thirds of the area of the wing. *Hindwing* with the blue area occupying about half the wing, confined to the disc and base, the rest of the wing black. UNDERSIDE, *both wings* as in the male.

Apparently one of the rarest species of the genus. Hewitson recorded it from Sylhet: in the Indian Museum, Calcutta, is a single female from that locality. I possess a male from Jalpaiguri. These are the only specimens known to me. The female very closely resembles the female of *A. eumolphus*, Cramer (= *A. bupola*, Hewitson), but may be known by the greater extent of the blue coloration on the upperside, by the more rufous ground colour of the underside entirely lacking the silky gloss which is one of the characteristics of that species, and by the anal lobe to the hindwing being fully twice as large.

789. **Arhopala adorea**, n. sp. (FRONTISPIECE, FIG. 139 ♂).

HABITAT: Sikkim; Khasi Hills; Tenasserim Valley, Burma; Singapore.

EXPANSE: ♂, 2·0 to 2·2; ♀, 2·2 inches.

DESCRIPTION: MALE. UPPERSIDE, *both wings* deep bluish-purple. *Forewing* with the costa and outer margin narrowly black. *Hindwing* with the costa broadly black, the outer margin a little more broadly black than in the forewing, the abdominal margin pale; the anal lobe black, crowned with a pure white spot. UNDERSIDE, *both wings* dull brown, all the spots and bands of a darker shade of brown than the ground, outwardly defined with grey. *Forewing* with three prominent increasing spots in the cell, a costal spot above the disco-cellular spot; two large spots beneath the median nervure divided by the first median nervule, a discal series of seven spots, the four uppermost forming a curved compact band, the two next divided by the second median nervule shifted inwardly from the line of the rest, the lowest spot in the submedian interspace large, placed obliquely outwards; a rather prominent dark submarginal macular band outwardly defined with grey. *Hindwing* with the spots and bands as usual; the anal lobe with a large intensely black spot, the anal area more broadly overlaid with metallic green scales than usual; *tail* black, tipped with white. FEMALE. UPPERSIDE, *both wings* of a lighter shade of purple than in the male. *Forewing* with the costa and outer margin broadly black. *Hindwing* with the costal, outer, and abdominal margins broadly black. UNDERSIDE, *both wings* like the male.

The male of *A. adorea* differs from that sex of *A. adatha*, Hewitson (Cat. *Lycænidæ* B. M., pl. iv, figs. 29, 30) in being rather larger, in the outer black border on the upperside of both wings being quite half as wide, the underside brown not rufous, with an additional costal spot in the forewing. It differs from fig. 31 (l. c.) of *A. adatha* on the underside in being brown not rufous, and in having the discal band in the forewing broken, less broad, and more macular. Mr. Hewitson gives Amboyna and Singapore as the habitat of *A. adatha*, but as his figures in my opinion represent two distinct species, and he does not say which figure represents the Amboyna or which the Singapore specimen, I am unable, not having access to the types, to say which of these figures represents the true *A. adatha*. (For further remarks on this species, see page 247). *A. adorea* is also closely allied to *A. silhetensis*, Hewitson, from which the male differs in having the outer margin of the forewing very convex instead of straight, the hindwing posteriorly rounded, instead of much elongated as in *A silhetensis*; the blue coloration of the upperside of the male also is richer and deeper, and the second spot of the discal series on the underside of the forewing no larger than the spot above and below it, while in *A. silhetensis* it is produced outwardly far beyond the line of the others.

Described from three males and one female from Singapore obtained by Mr. W. Davison. I have also seen a male from the Tenasserim Valley, Burma, collected by Mr. W. Doherty, and there are single males from Sikkim and the Khasi Hills in my collection.

The figure shews both sides of the type male specimen from Singapore in the collection of the Raffles Museum, Singapore.

790 **Arhopala yendava**, Grose Smith.

Amblypodia yendava, Grose Smith, Ann. and Mag of Nat. Hist, fifth series, vol. xix, p 297 (1887).

HABITAT: Yendaw, Burma.

EXPANSE: ♂, ♀, 2·25 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* lilac-blue, margins broadly dark brown. UNDERSIDE, *both wings* brown. *Forewing* with a spot on the middle of the costa; a transverse band of six spots, the first four curving outwards, the fifth further from the outer margin, the sixth in a line with the fourth; two spots in and one at the end of the cell, and a submarginal indistinct band. *Hindwing* with ten basal spots and a medial band of spots, of which the first two are distinct, the next four confluent, the seventh angulated, and the eighth on the inner margin elongated; a submarginal indistinct band, a black spot at the anal angle, above which and on each side of the tail is an irroration of silvery greenish-blue. FEMALE. UPPERSIDE, *both wings* violet-blue"

"Near to *A atosia*, [Hewitson, Ill. Diurn. Lep, p. 9. n 37, pl ii, figs 8, 9, *female*, from Sumatra], but much larger, and the arrangement of the spots on the underside is quite different." (*Grose Smith*, l. c.)

I have not seen this species, which appears to be distinct. It is of large size, the sexes alike except that the male is lilac-blue, the female violet-blue on the upperside. There may be a mistake in the description, as both sexes appear to have an equally wide outer black margin on the upperside of both wings, which as far as I know occurs in no other species of this group. On the underside no mention is made of the two spots below the cell of the forewing which are divided by the first median nervule and are almost always present.

791. **Arhopala amantes**, Hewitson.

Amblypodia amantes, Hewitson, Cat *Lycænidæ* B M, p 4, n 17, pl ii, figs 2, 3, *male*; 1, *female* (1862); *Arhopala amantes*, Wood Mason and de Nicéville, Journ A. S. B, vol l, pt 2, p 250, n 76 (1881); *Nilasera amantes*, Moore, Lep. Cey., vol 1, p 115, pl xliv, figs 2a, 2b, *male*, 2, *female*, 2c, *larva* and *pupa* (1881); *Nilasera apela* Swinhoe, Proc. Zool. Soc Lond, 1886, p 429, n. 64, pl xl, fig 4, *male*.

HABITAT: India, Ceylon, Burma, South Andaman Isles, Makassar.

EXPANSE: ♂, ♀, 2·2 to 2·5 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant morpho-blue, the costal and outer margins with a narrow border of black. UNDERSIDE, *both wings* grey, the spots and bands rufous-brown. *Forewing* with the transverse band broken, the middle spot projecting outwards. *Hindwing* with the medial band having two branches composed of unequal angular spots, the anal angle irrorated with light green. FEMALE like the male, except that the blue of the UPPERSIDE of *both wings* is confined to half the wing, with the margins very broad."

"Variety *a*, from Makassar. FEMALE. UPPERSIDE, *both wings* with the blue colour lighter, occupying a still smaller space than the above-described typical form." (*Hewitson*, l. c.)

"Larva elongated, oval, depressed at the ends, anterior segment scutate, with a lateral row of fine short hair; green, with two subdorsal reddish lines, a red patch on the second and last segments, the interdosal space marked with blackish spots and lines; a lateral row of spots." Food-plant not recorded. "PUPA broad, thorax convex, head slightly produced; thorax and wing-cases greenish, abdomen reddish." (*Moore*, l. c.)

There is not much difference in the shade of blue on the upperside of the males of *A. amantes* and *A. centaurus*, local race *pirama*; but the former is rather deeper and richer. There is more difference in the females, the female of *A. amantes* being almost uniform throughout, while in *A. pirama* the bases of the wings are considerably lighter. The markings of the underside are also very similar, though, as pointed out by Mr. Hewitson, the fourth spot of the discal band of the forewing in *A. amantes* is usually out of line, and nearer to the margin than the other spots forming the band. The spots in the cell of the forewing are usually smaller, and, as in *A. centaurus*, usually marked anteriorly with white or greenish. The distinguishing character of the species, however, is the presence of a well-formed anal lobe to the hindwing, which on the underside is usually centred with deep black; *A. centaurus* entirely lacks this lobe. The colour of the ground of the underside and the prominence of the markings are perhaps even more variable in *A amantes* than they are in *A. centaurus*.

In India, *A. amantes* is more widely spread than *A centaurus*. It occurs all along the foot of the Himalayas from the Dehra Dun to Sikkim, in the plains of Bengal, the Central Provinces, and in Bombay, and thence southwards to Travancore and Ceylon; in the latter island it is found at "Colombo. Shrubby parts of cinnamon gardens, about May to end of June. Flight strong, rapid; conceals itself under leaves with wings always folded" (*Hutchison*). "Common at Colombo" (*Wade*). "Colombo. Cinnamon gardens and low country generally, fond of resting on the leaves of the Mango-tree" (*Mackwood*). In May, 1882, I took a single male specimen in Calcutta under the big banian tree in the Botanical Gardens. Mr. E. H. Aitken writes of it in Bombay as follows:—"*N. amantes*, Hewitson, is not common, and I am not sure of the limits of its season. I have seen it oftener about the beginning of June than at any other time, and oftener at Karanja across the Bombay Harbour than at any other place. It flies very fast." (*Aitken*, Journ. Bombay Nat. Hist. Soc., vol. i, p. 217, n 48 (1886). I possess a single female specimen from Moulmein, Burma, which differs from the typical form in that the anal lobe on the underside of the hindwing is centred with reddish-brown instead of deep black, the blue coloration of the forewing on the upperside extends well above the discoidal cell nearly reaching the costa and beyond the cell also, in the hindwing it is more restricted to the base. The single example I have seen from the Andamans differs a good deal from the typical form: it is smaller, the area of the blue coloration of the upperside is rather different, all the markings below are smaller, more compact and prominent. It probably represents a new species, but I prefer not to name it till I possess larger material. I append a description of *Arhopala apella*, Swinhoe, a species which is strictly synonymic with *A. amantes*.* I have examined a "co-type" male example from Mhow in Colonel Swinhoe's collection.

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* *Arhopala apella*, Swinhoe. *Nilasera apella*, Swinhoe, Proc. Zool. Soc. Lond., 1885, p. 429, n. 64, pl xl, fig. 4, *male*. HABITAT: Mhow, March EXPANSE: 2·1 inches DESCRIPTION: "Allied to *N.* [=*A.*] *amantes*, Hewitson. UPPERSIDE of a brighter and paler blue, but similar to *A. amantes* in the deep costal band on the forewing of the male, which is absent in the female, and in the far deeper costal band of the hindwing and marginal band of both wings UNDERSIDE quite different, the ground-colour being of a uniform pale brownish grey with an ochreous tinge, this tinge showing quite distinctly on the brown portions of the forewing, the costal portion and much of the hindwing being silvery-grey. *Forewing* with one small spot in the cell near the base, and a larger one also within the cell, a little forward of its middle, the upper portions of both touching the subcostal nervure; another spot, square and larger at the end of the cell, and a smaller one below this in the angle of the first median interspace and below this is a spot elongated into a band running along the interspace for more than half its length below the first median nervule, and half filling up that portion of the interno-median interspace; there is also a discal row of six confluent spots from the

792. **Arhopala vihara,** Felder.

Amblypodia vihara, Felder, Wien. Ent. Monatsch., vol. iv, p. 395, n. 5 (1860); id., Kheil, Rhop. der Insel Nias, p. 33, n. 122 (1884); *Arhopala vihara*, Felder, Reise Nov., Lep., vol. ii, p. 228, n. 253, pl. xxix, fig. 7 (1865); id., Moore, Proc. Zool. Soc. Lond., 1878, p. 835; *Narathura vihara*, Distant, Rhop. Malay., p. 270, n. 16, woodcut n. 83 (1885).

HABITAT: Taoo, Upper Tenasserim, 3,000-5,000 feet (*Moore*); Malacca interior (*Felder*); Nias Island (*Kheil*).

EXPANSE: 2·0 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* deep violet-blue. *Forewing* with a blackish-fuscous costal margin rather broader exteriorly. *Hindwing* with a fuscous costal border passing on into a broadish exterior border increasing in width, and with the interior border also fuscous. UNDERSIDE, *both wings* light fuscous, with a submarginal fascia common to both. *Forewing* with a pair of annular spots within the cell, of a deeper tint than the ground colour, a disco-cellular spot, two spots below the median nervure, a chain-like exterior fascia ending at the first median nervule and broken at the third median nervule. *Hindwing* with five annular basal spots of a deeper tint than the ground-colour, a sixth spot internal, a small discoidal fascia in three pieces, an exterior chain-like fascia broken at the second subcostal nervule close to the small fascia, bent upwards posteriorly and continuous; all these markings fuscous and margined with a much paler tint. *Forewing* with the internal third of its surface pale. *Hindwing* with three black anal spots increasing in size, the middle spot entirely, the other two only inwardly sprinkled with metallic blue. FEMALE. UPPERSIDE, *both wings* of a paler tint than those in the male. *Forewing*, with a sinuous costal margin, and a broad exterior margin fuscous. *Hindwing* with the costal border passing on into the exterior border of the same colour, the interior margin paler brown. UNDERSIDE, *both wings* altogether as in the male."

"Strikingly different from the above-described species [*A. agnis* Felder] in the much darker and moderately broad bordered upperside of the male. The forewing is blunter and the hindwing shorter and more produced at the apex than in *A. agnis*, Felder." (*Felder*, l. c. in Reise Novara.)

I have not seen this species, nor has Mr. Distant obtained it from the Malay Peninsula. Unfortunately, no figure has been given of the upperside of the male, and it is impossible to gather from the description alone what is the width of the black border. The underside has been figured, and appears to agree very closely with that of *A. agnis*, Felder. The distinctive characters of *A. vihara*, as compared with *A. agnis*, appear to be its rather smaller size, the deep instead of brilliant violet-blue of the upperside of the male; the uncertain width of the black outer border, which is so narrow in *A. agnis* that it can hardly be said to exist, hardly extending inwardly beyond the cilia. *A. vihara* is still nearer to *A. amantes*, Hewitson, from which it may be known by the discal band on the underside of the hindwing being anteriorly split up into three pairs of spots, instead of being continuous.

793. **Arhopala atosia,** Hewitson (FRONTISPIECE, FIG. 138 ♂)

Amblypodia atosia, Hewitson, Ill. Diurn. Lep., p. 9, n. 37, pl. ii, figs. 8, 9, *female* (1863); id., Druce, Proc. Zool. Soc. Lond., 1873, p. 353, n. 4; id., Butler, Trans. Linn. Soc. Lond., Zoology, second series, vol. i, p. 548, n. 5 (1877); *Narathura atosia*, Distant, Rhop. Malay., p. 265, n. 7, pl. xxiii, figs. 6, *male*; 5, *female* (1885).

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costa commencing with a small one and getting gradually larger and ending on the first median nervule at the end of the band, all the spots brown, surrounded with yellowish white, the white borders being clearest round the two spots in the cell and the two outside it. *Hindwing* with four or five brown spots near the base, a central whirl [? whorl] of spots of the same colour disconnected, and irregular like a zigzag band, a discal whorl of similar spots but paler, and the space on each side filled in with other bands of spots so pale as to be only here and there visible; a black spot at the anal angle, and a white silvery streak on the margin running from this spot to the first median nervule and clouded with dark brown atoms. *Tails* black, tips white. *Both wings* with the margins brown, diffused inwardly." (*Swinhoe*, l. c.)

Colonel Swinhoe describes the male of his *A. apella* as having a deep costal band on the upperside of the forewing. This is incorrect, the description applies to the female, and he has evidently reversed the sexes. The shade of colour on the underside is not a specific character, in both *A. centaurus* and *A. amantes* it is extremely variable, the dark coloured specimens coming from districts of heavy rainfall or are seasonal forms occurring in the rains, the light coloured examples occur in dry localities or during the dry season.

HABITAT: Sumatra (*Hewitson*), Borneo (*Druce*), Malacca (*Butler*), Mergui, Tenasserim Valley, Burma.

EXPANSE: ♂, ♀, 1·7 to 2·0 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* lilac-blue, the margins black, very narrow. *Forewing* with a large medial spot of a somewhat different colour, not seen except in a certain light, and not produced by any unusual arrangement of the scales. UNDERSIDE, *both wings* rufous brown. *Forewing* with the transverse band broken, composed of seven parts, three together, the fourth projecting outwardly from the rest, the three following further from the margin than the fourth. FEMALE. UPPERSIDE, *both wings* violet blue. *Forewing* with the costal margin, the apex, and the outer margin broadly black, the veins black. *Hindwing* with the apex and outer margin broadly dark brown, the veins black."

"The spots on the underside of the male are less distinctly marked than those of the female. This species scarcely differs on the underside from *A. adonias* [Hewitson, from Java], and *A. eumolphus*, Cramer. It is nearly allied to *A. agaba*, Hewitson; on the upperside the two species are alike." (*Hewitson*, l. c.)

Mr. Distant did not obtain this species in the Malay Peninsula, but he figures the opposite sexes from specimens from Malacca contained in the British Museum. These figures shew the male with a very broad outer black margin to both wings on the upperside. This is almost certainly incorrect, and either two varietal female forms of this species, or females of two different species, have been figured; Hewitson distinctly says that the margins are very narrowly black in the male, in one place that *A. atosia* is the same on the upperside as *A. agaba*; and in another describes a medial spot of a different colour from the rest of the wings on the upperside of the forewing in the male*; this spot is certainly not present in *A. agaba*. *A. atosia* in both sexes may, however, be easily known from *A. agaba* by having the discal band on the underside of the forewing in both sexes broken below the fourth spot from the costa, and by the fourth spot being nearer the margin than the rest, in *A. agaba* the band is nearly straight, unbroken, all the spots one below the other. Herr P. C. T. Snellen (Midden Sumatra, Lepidoptera, p. 21) appears to consider that *A. atosia* is a variety of the female of *A. eumolphus*, Cramer. In this, however, I think, he is incorrect. Hewitson describes both sexes of *A. atosia*, and figures the female which from the figure may at once be distinguished from the female of *A. eumolphus* by having the purple area on the upperside of much greater extent.

I have received two male and three female specimens of this species from Singapore, kindly sent me by Mr. W. Davison, and have also seen two males and three females collected in Mergui and the Tenasserim Valley, Burma, by Mr. Doherty. They agree in coloration and markings in both sexes almost exactly with the species I identify as *A. antimuta*, Felder; they are also of about the same size, but may be known by having a tail, which *A. antimuta* lacks. In the male the outer black border is half as wide on the upperside as in *A. antimuta*.

The figure shews both sides of a male specimen from Singapore in my collection.

794. **Arhopala abseus**, Hewitson.

Amblypodia abseus, Hewitson, Cat. *Lycænidæ* B. M., p. 9, n. 40, pl. v, figs. 41, 42 (if corrected in MS., then figs. 51, 52), *female* (1862), idem, id., Ill. Diurn. Lep., p. 10, n. 44 (1863); id., Druce, Proc. Zool. Soc. Lond., 1873, p. 353, n. 6; *Satadra alsens*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 41 (1884).

HABITAT. Sylhet, Singapore (*Hewitson*), Borneo (*Druce*), Sikkim, Burma.

EXPANSE: ♂, ♀, 1·4 to 1·5 inches.

DESCRIPTION: "FEMALE. UPPERSIDE, *both wings* bright blue, the margins broadly brown. UNDERSIDE, *both wings* ferruginous. *Forewing* with a broad transverse band in the middle, the usual band nearer the apex, at first broad and of equal breadth, then broken nearly apart in the middle and projected towards the margin, the lower part becoming narrower to its lower extremity. *Hindwing* lilac in the middle, with a light spot on the middle of the costal margin." (*Hewitson*, l. c. in Cat. *Lycænidæ* B. M.)

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* This very curious feature is only found in one other species, as far as I know, the *A. antimuta* of Felder.

"Most of the examples of this species have a nearly white spot on the middle of the costal margin on the underside of the hindwing as in *A. ammon*, Hewitson" (*Hewitson*, l c in Ill. Diurn. Lep) MALE. UPPERSIDE, *both wings* differ from the female only in the coloration of the disc being rather deeper in shade, more purple than blue

A common species in Sikkim, occurring in June, July, October, and December. Hewitson recorded it from Sylhet, but I have seen no specimen from there, though it is more than probable that it occurs throughout Assam Dr J Anderson obtained it at Yimiki, King Island, Mergui Archipelago, in February, Captain C. H E Adamson has sent me a single female taken in May at Tsenbo, Upper Burma, and Mr Doherty obtained specimens at Myitta in the Tenasserim Valley in the cold weather, which he notes as agreeing perfectly with Sikkim examples Although Mr. Hewitson recorded it from Singapore, Mr Distant does not include it in his "Rhopalacera Malayana" *A. abseus* cannot be mistaken for any other, the broad band at the end of the cell from the costa to the first median nervule on the underside of the forewing, and the prominent whitish quadrate patch on the middle of the costa of the hindwing being unique characters In addition to the long tail at the termination of the first median nervule, there is a short one at the termination of the second median nervule, and another at the termination of the submedian nervure The shape of the hindwing is also unusual, the costa being very straight, and the apex acute. There is hardly any difference between the sexes.

795 **Arhopala ammon,** Hewitson

Amblypodia ammon, Hewitson, Cat *Lycænidæ* B M, p 9 n 41, pl v, figs 49, 50, *female* (1862), *Narathura ammon* Distant, Rhop Malay p 272, n 19 woodcut n 83, *female* (1885)

HABITAT Singapore (*Hewitson*), Myitta, Tenasserim Valley, Burma.

EXPANSE: ♂, 1·2, ♀, 1·3 inches.

DESCRIPTION "MALE UPPERSIDE, *both wings* lilac blue, the margins with a narrow border of black UNDERSIDE, *both wings* rufous and lilac grey *Forewing* with the band broken, the middle spot projecting outwards *Hindwing* without a transverse band, with a white spot on the middle of the costal margin, the black spots at the anal angle irrorated with silvery blue FEMALE. UPPERSIDE, *both wings* like the male, except that the margins are much broader UNDERSIDE, *both wings* like the male (*Hewitson*, l. c)

Mr Distant did not obtain this species in the Malay Peninsula, so probably the type specimens were the only ones known until lately, when Mr Doherty obtained two males in the Tenasserim Valley, Burma It is a little smaller than *A abseus*, Hewitson, both sexes differing from that species in having more blue coloration on the upperside and a single tail to the hindwing On the underside it superficially resembles *A. abseus* in possessing a prominent white spot on the middle of the costa of the hindwing, but all the other markings are a good deal different, being more annular. Mr. Doherty's specimens are undoubtedly males, and have the outer black borders on the upperside of both wings as broad as in Hewitson's figure, which is stated to be that of a female Mr. Hewitson notes that the male of *A ammon* has these borders much narrower than in the female There is evidently some confusion regarding the species; it may hereafter be found that the Burmese form represents a species distinct from that from Singapore

796. **Arhopala ænea,** Hewitson.

Amblypodia ænea, Hewitson, Ill Diurn Lep, p 14c, n 87, pl iiic, fig. 55, *male* (1869).

HABITAT. Sikkim, Khasi Hills.

EXPANSE: ♂, ♀, 1·55 to 1·80 inches.

DESCRIPTION. "MALE. UPPERSIDE, *both wings* violet-blue, the margins dark brown, narrow UNDERSIDE, *both wings* rufous, with several very indistinct bands of a slightly darker colour. *Forewing* with the transverse band unbroken, and of equal breadth." (*Hewitson*, l c.) FEMALE. UPPERSIDE, *both wings* black. *Forewing* with the purple coloration of a much lighter shade than in the male, and much more restricted in extent. *Hindwing* with a small patch of purple in the middle of the disc. UNDERSIDE, *both wings* as in the male

The markings and coloration of the underside of both sexes of this species are very distinctive; the ground-colour is reddish-brown, and all the spots and bands are very obscure. The forewing has a very small spot near the base of the cell, a larger transverse one in the middle, and a still larger one closing the cell, a narrow discal unbroken band, and a submarginal more obscure band, all of a slightly darker shade than the ground, and outlined paler. There is usually a very small but prominent black spot near the costal base of the hindwing, but, with this exception, all the other markings are obscure, as in the forewing; a patch of metallic blue scales is rarely present at the anal angle.

A rare species in Sikkim; Mr Otto Moller has specimens taken in October and November. The Revd. Walter A. Hamilton has obtained it in profusion in the Khasi Hills.

797 **Arhopala agaba**, Hewitson.

Amblypodia agaba, Hewitson Cat *Lycænidæ* B M, p 8 n 39, pl iv figs 39 40, *female* (1862), *Satadra agaba*, Moore, Journ A S B, vol. liii pt 2 p 38 (1884), id, Elwes and de Nicéville, Journ A S B, vol. lv, pt 2, p 432, n 104 (1886)

HABITAT. India (*Hewitson*), Mergui Archipelago, Upper Tenasserim, Tavoy.

EXPANSE. ♂, 1 65 to 1 80; ♀, 1 65 to 1 80 inches

DESCRIPTION. "FEMALE UPPERSIDE, *both wings* bright blue, with the margins broadly black. UNDERSIDE, *both wings* lilac grey, the spots dark red brown. *Forewing* with the transverse band long, nearly equal in breadth, except at the extremities, formed of seven spots. *Hindwing* with two branches, the inner branch becoming obscure beyond the middle, the anal angle irrorated with white." (*Hewitson*, l c) "MALE. UPPERSIDE, *both wings* differ from those of the female only in being purple rather than bright blue, the outer margins narrowly and evenly, instead of broadly, black UNDERSIDE, *both wings* like the female." (*Elwes* and *de Nicéville*, l. c)

This species is very brilliantly glossed with purple on the underside. In the forewing there are three increasing spots in the cell, one on the costa above the spot closing the cell, one below the cell at the base of the first median interspace, and a discal band as described above. The hindwing has four basal spots, a spot below the costal nervure, another in the middle of the cell, the discal band bifurcated, the inner bifurcation consisting of three spots, one closing the cell, and two divided by the second median nervule; a prominent black spot on the anal lobe, beyond which the margin is sprinkled with metallic green not white scales, as stated by Hewitson.

In the Phayre Museum, Rangoon, is a male taken at Rangoon in March, in the Indian Museum, Calcutta, a female taken at Mergui on 22nd March, 1882, by Dr J Anderson, also a male from Tavoy obtained by the Museum Collector, Moti Ram. I possess two males from the Thoungyeen forests taken in March, and one from the Upper Thoungyeen forests taken in April, by Major C T. Bingham. This species should be easily recognisable. It is perhaps nearest to *A selta*, Hewitson, but the male on the upperside is of a much deeper shade of purple, the outer black margins narrower, the discal band of the forewing on the underside also narrower, and less regular and continuous.

I give as a foot-note* a description of *A. aroa*, Hewitson, originally described from Sumatra, and identified from Malacca by Mr. Butler. I also identify the species, but with considerable doubt, from Singapore, it being extremely difficult in many cases to identify with certainty species of this genus without having access to the type specimens or at any rate without specimens from the habitat of the type.

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* *Arhopala aroa*, Hewitson *Amblypodia aroa*, Hewitson, Ill Diurn Lep, p 13, n 60, pl ii, fig. 19, *male* (1863), id, Butler, Trans Linn Soc Lond, Zoology, second series, vol 1, p 548, n 9 (1877); *Narathura aroa*, Distant, Rhop Malay, p 266, n 9, pl xxiii, fig 17, *male* (1885). HABITAT Sumatra (*Hewitson*), Malacca (*Butler*) EXPANSE. *Male* 1 7 inches DESCRIPTION. "MALE. UPPERSIDE, *both wings* violet blue the margins *very narrow*, black UNDERSIDE, *both wings* rufous brown FOREWING with the band of nearly equal breadth slightly curved"

"*A aroa* is very nearly allied to *A hypomuta*, Hewitson, the blue of its upperside is less brilliant, and the spots and bands of the underside appear to be much wider apart. *A hypomuta* seems, on the hindwing, as if covered throughout with spots, the spaces between the bands and spots having nearly the same appearance as the usual spots and bands themselves have (*Hewitson*, l c)

798 **Arhopala selta,** Hewitson.

Amblypodia selta, Hewitson, Ill Diurn Lep, p 14*f*, n 92, pl iia, figs 36, 37, *female* (1869), *Satadra selta*, Moore, Journ A S B, vol liii, pt 2, p 38 (1884).

HABITAT. Moulmein (*Hewitson*), Mergui Archipelago

EXPANSE. ♀, 1·9 inches (*Hewitson*); ♂, 1·4; ♀, 1·5 inches (*Hewitson's figure*).

DESCRIPTION: FEMALE. "UPPERSIDE, *both wings* lilac-blue, with the margins broadly dark brown, darkest on the forewing *Forewing* with a black line at the end of the cell, UNDERSIDE, *both wings* lilac, with the usual subbasal spots, and a submarginal macular band. *Forewing with a straight broad equal band* before the apex *Hindwing* with a large quadrate spot at the middle of the costal margin, from which branch off two other bands of spots all rufous-brown, black spots on each side of the tail and at the anal angle irrorated with blue."

"Differs from *A. alea*, Hewitson, only in the very straight and much broader band before the apex of the forewing, which is, in this genus, the most prominent guide to species." (*Hewitson*, l. c.)

In the Indian Museum, Calcutta, is a single male of this species collected at Yimiki, King Island, Mergui Archipelago, by Dr J Anderson, on 25th February, 1882 This specimen Mr Moore recorded[*] as *S agaba*, Hewitson, though with some doubt, as he ticketed it "This is probably *agaba* ♂" It certainly is not that species, from which it differs in being smaller, of a more brilliant, more shining, and lighter purple colour on the upperside, in having the outer black margins fully three times as broad, and on the underside of the forewing the discal band much broader, not at all divided into spots, and apparently nearer the margin. It is not so strongly glossed with purple as in *A agaba*, in which a strong purple gloss is a very prominent feature The disposition and number of the spots on the underside is the same in *A. agaba* and *A. selta*. This species seems to be quite distinct, and should be easily recognised.

799. **Arhopala canaraica,** Moore

Satadra canaraica, Moore, Journ A S B, vol liii, pt 2 p 39 (1884), id, Waterhouse, Aid, pl. clxv, figs 5, 5*a*, *male* (1885)

HABITAT. Canara, S India (*Moore*); Travancore.

EXPANSE ♂, 1·37 to 1·60; ♀, 1·75 inches

DESCRIPTION. "Allied to *S.* [=*A.*] *alea*, Hewitson MALE and FEMALE. UPPERSIDE, *both wings* of a more purplish violet blue than in *S alea*, the marginal black border comparatively narrower in the male UNDERSIDE, *both wings* of a darker purplish violet brown. *Forewing* with the basal spots darker, the two cell-spots very small and round, the discocellular spot and the two below the cell narrower, the transverse discal band regular and not broken on the third median nervule, the submarginal and marginal lunules obsolescent. *Hindwing* with the basal and subbasal spots darker and very small, the discal zigzag band

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Mr Distant has not received this species from the Malay Peninsula but figures a specimen now in the British Museum, collected by Captain Pinwill in Malacca As figured by Hewitson the forewing has three increasing spots in the cell a fourth minute spot on the costa above the spot closing the cell two spots below the cell divided by the first median nervule, and a very nearly straight discal series of six nearly equal sized spots On the hindwing are four basal and three subbasal spots and one closing the cell the usual irregular discal series, and a submarginal series I think it more than probable that the Malacca specimen figured by Distant is not the true *A* *aroa*, as it shows quite a wide black margin to both wings on the upperside, while Hewitson emphasises the fact that the margin is very narrow Mr Distant's specimen also is a good deal larger than the type

Mr W Davison has sent me a long series of both sexes of a species of *Arhopala* from Singapore which I think it best to call by the name *aroa* The male is violet blue on the upperside the black margins are very narrow, and the shape of the band on the underside of the forewing more or less agrees with Hewitson's description and figure of the species, but it is rather variable, being sometimes quite continuous and sometimes broken below the second median nervule, it also agree in size with the type These specimens differ a little, however, from the figure in that the spot at the base of the first median interspace of the forewing on the underside is much nearer to the discal band than is shown in Hewitson's figure, from which it looks to me to be unnaturally widely separated Under the circumstances, I consider it better to call my specimens *aroa* than to describe them as a "new species In these specimens all the markings of the underside are prominent, of a darker brown than the ground and outwardly defined with grey The female differs from the male on the upperside of both wings in having the blue coloration of a lighter more purplish tint, the costa and outer margins of both wings and the abdominal margin of the hindwing broadly black.

[*] *Satadra agaba*, Moore, Journ. Linn. Soc. Lond, Zoology, vol. xxi, p 44 (1886).

narrower and less distinct, the submarginal and marginal lunules obsolescent; the anal angle less speckled with metallic-green scales, the anal black spot only present."

"In *S. alea* the underside is uniformly purplish-brown, the markings all of a regular colour and distinctly lined with pale purplish-white." (*Moore*, l. c.)

I possess a single male example of this species from Travancore, kindly sent me by Mr. Harold S. Ferguson. It is remarkable in having all the spots on the underside smaller than in any species of the genus known to me. It probably takes the place in extreme South India of *A. atrax*, Hewitson.

800. **Arhopala alea,** Hewitson.

Amblypodia alea, Hewitson, Cat. *Lycænidæ* B. M., p. 12, n. 57, pl. vii, figs. 79, 81, *male* (1852); *Satadra alea*, Moore, Journ. A. S. B., vol. liii, pt. 2, p. 38 (1884).

HABITAT: India (*Hewitson*).

EXPANSE: ♂, 1·5 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* violet-blue. *Forewing* with the outer [black] margin rather broad. *Hindwing* with the margins as broad as in the females of other species. UNDERSIDE, *both wings* brown, tinted with lilac. *Forewing* with the transverse band long and narrow, slightly curved. *Hindwing* with the band broken, ill-defined, the anal angle irrorated with white." (*Hewitson*, l. c.)

Mr. Hewitson's recorded locality for this species is very vague. I have not seen a specimen.

801. **Arhopala atrax,** Hewitson.

Amblypodia atrax, Hewitson, Cat. *Lycænidæ* B. M., p. 13, n. 58, pl. vii, figs. 80, 82, *female* (1862); id., Moore, Proc. Zool. Soc. Lond., 1865, p. 774; *Satadra atrax*, id., Journ. A. S. B., vol. liii, pt. 2, p. 39 (1884).

HABITAT: India (*Hewitson*); foot of the Himalayas from Dehra Dun to Bhutan; Malda, and Chota Nagpur Districts; Central Provinces; Calcutta; Orissa; Nilgiris.

EXPANSE: ♂, ♀, 1·4 to 1·7 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* brilliant violet-blue, the margins with a broad border, as in *A. alea*, Hewitson. UNDERSIDE, *both wings* rufous-brown, tinted with lilac. *Forewing with the transverse band broken at the middle*, the lower half at a greater distance from the margin. *Hindwing has the medial band with its two branches unbroken*, the anal angle irrorated with silvery-blue. FEMALE. UPPERSIDE, *both wings* rufous-brown. *Forewing* only with a large spot of lilac-blue from the base to the middle. UNDERSIDE, *forewing differs from the male in having the band unbroken. Hindwing with the upper branch of the band broken off.*"

"I have had much difficulty in making out *A. atrax* and *A. alea* to my satisfaction. I believe that I am correct with regard to the sexes of *A. atrax*; they may, however, belong to different species." (*Hewitson*, l. c.)

I give Mr. Hewitson's description of this species as he wrote it. I have no doubt at all that he mixed up two distinct species under *A. atrax*, but the species is easily recognisable from his figure of the female. I describe the species in full thus:—

MALE. UPPERSIDE, *forewing* with the costa narrowly, the outer margin somewhat broadly (about one-tenth of an inch broad) blackish, the rest of the wing rather obscure dull purple. *Hindwing* with only a small patch of purple from the base to the middle of the disc, a whitish lunule on the margin on either side of the tail. UNDERSIDE, *both wings* greyish-brown, faintly glossed with purple, the spots and fasciæ small but distinct, dark brown margined with greyish. *Forewing* with the inner margin broadly paler; a very small spot near the base of the cell, a larger elongated one at its middle, a still larger attenuated spot closing the cell; two large spots below the cell divided by the first median nervule; an even slightly outwardly-curved discal macular fascia, its lowest spot below the first median nervule separated and placed obliquely; submarginal and marginal obscure fasciæ. *Hindwing* with four very small subbasal spots arranged nearly equi-distantly across the wing, another spot below the costal nervure before the middle of the costa, one in the middle of the cell, an elongated spot closing the cell, with two spots below divided by the second median nervule, an irregular discal catenulated band; submarginal and marginal fasciæ more prominent than in the forewing, the anal region from the black anal lobe to the second median nervule irrorated with metallic blue scales. FEMALE. UPPERSIDE purplish-brown. *Forewing* with the purple area much more restricted than in the male, the disco-cellular nervules marked with a black tooth from the costal area. *Hindwing* with no purple area. UNDERSIDE, *both wings* marked precisely as in the male.

A. atrax shares with *A. amantes*, Hewitson, the peculiarity of being a plains insect, with its head-quarters in Orissa and Chota Nagpur, where at times it may be said to swarm. Mr. P. W. Mackinnon has sent me specimens from as far west as Dehra Dun, which were taken in April; Mr. W. H. Irvine has found it at Bholahât in the Malda district; it occurs rarely in Sikkim; Mr. A. V. Knyvett has taken it at Jalpaiguri; it is very decidedly rare in Calcutta and Barrackpore, but swarms as stated above, in Chota Nagpur, Central Provinces, and Orissa. Mr. G. F. Hampson reports having taken a single specimen on the lower slopes of the Nilgiris. It may be best discriminated from *A. alea*, Hewitson, and *A. canaraica*, Moore, by the greyer tone of coloration on the underside, these species (especially the latter) having the purple washing more prominent and of a vinous shade.

802. **Arhopala aida,** de N.

A. aida, de Nicéville, Journ. Bomb. Nat. Hist. Soc. vol. iv, p. , n. , pl. A, fig. 1, *male* (1889).

HABITAT: Burma.

EXPANSE: ♂, 1·60; ♀, 1·45 inches.

DESCRIPTION: "MALE. UPPERSIDE, *both wings* shining bluish-purple of exactly the same tint as in *A. selta*, Hewitson, and *A. rafflesii*, mihi. *Forewing* with the outer margin broadly black (a little broader than in *A. selta*). *Hindwing* with the outer black margin even, as broad as in the forewing; the costa more broadly black. UNDERSIDE, *both wings* purplish-brown, strongly glossed with purple all the markings prominent, a little darker than the ground-colour, outwardly narrowly and clearly defined with whitish. *Forewing* with the inner margin broadly paler; an oval spot near the base of the cell; an oblong one at its middle, with a costal spot above it; a quadrate spot closing the cell, also with a costal spot above it; a discal macular band dislocated below the third median nervule, the fourth spot nearer the margin, the two spots which follow further removed from the margin, a large quadrate spot in continuation in the submedian interspace; a pair of submarginal fasciæ, but more prominent than usual. *Hindwing* with the usual basal annular spots, a spot closing the cell, a discal band formed of spots arranged more or less in pairs, the usual marginal lunular fasciæ, the small anal lobe black, a small black spot in the first median interspace on the margin, the space between this spot and the anal angle sprinkled with metallic-green scales. FEMALE. UPPERSIDE, *both wings* of a lighter more bluish shade than in the male, the outer margins much broader; otherwise as in the male."

"Described from a single male (the type) captured by Major C. T. Bingham on the Pegu Yoma, Burma, in December, 1887, and two males and a female captured by Mr. W. Doherty at Mergui and in the Tenasserim Valley in the cold season of 1888-89. One of these males differs slightly from the type in having all the markings of the underside rather larger and darker, consequently they are more prominent." (*de Nicéville*, l. c.)

Below will be found a description of *A. adatha*, Hewitson, from Malacca and Singapore.* What I take to be the typical form of this species (figs. 29 and 30) is rather larger than *A. aida*

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* *Arhopala adatha*, Hewitson. *Amblypodia adatha*, Hewitson, Cat. *Lycænidæ* B. M. pl. iv, figs 29, 30, *male* (1862); id., Butler, Trans. Linn. Soc. Lond., Zoology, second series, vol. i, p. 548, n. 4 (1877); *Narathura adatha*, Distant, Rhop. Malay., p. 265, n. 6, pl. xxiii, figs. 1, *male*, 2, *female* (1885). HABITAT: Malacca, Singapore (*Distant*); Borneo (*Butler*). EXPANSE: *Male* and *female*, 1·6 to 1·7 inches (*Distant*). DESCRIPTION: "MALE. UPPERSIDE, *both wings* dark violaceous blue (a specimen received from Singapore has the colour above darker blue and less violaceous than in the figures here given, which are taken from Malaccan specimens in the British Museum). *Hindwing*, apex of tail greyish-white. UNDERSIDE, *both wings* brownish, with the following spots and fasciæ margined with greyish:—*Forewing* with two spots in, and one at the end of the cell, two spots